AUG. 19 1960

PETROLEUM WEEK

A McGRAW-HILL PUBLICATION

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Refiners borrow a seismic technique 65
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SPECIAL REPORT

Stiff competition is forcing petrochemical manufacturers more and more to custom-tailor their products. But this may turn out to be a mixed blessing

page 40

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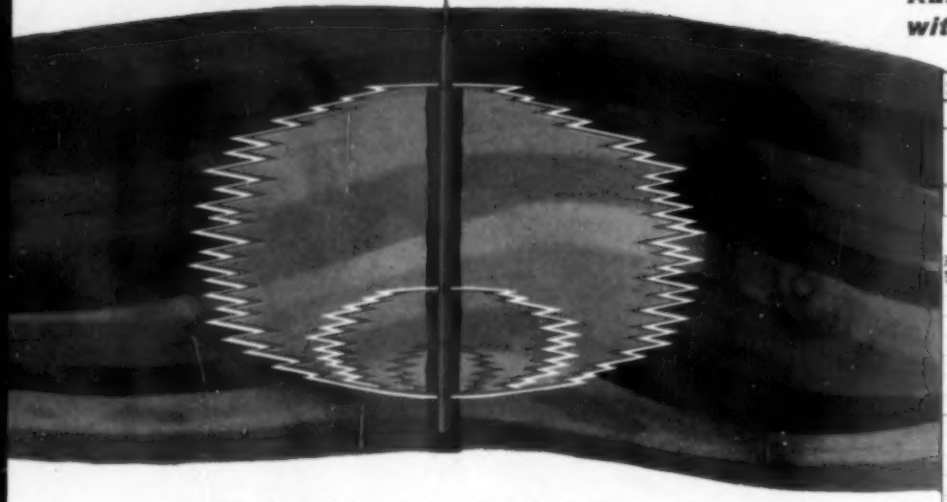

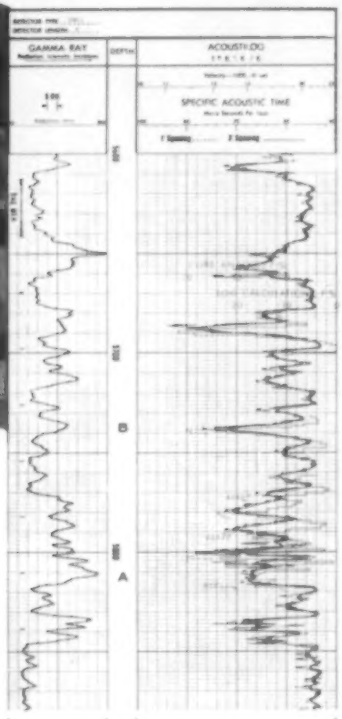

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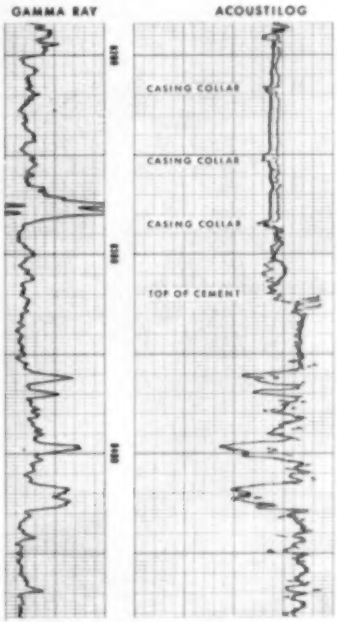
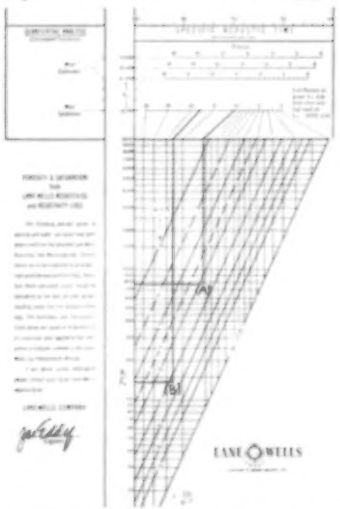


Acoustilog used to locate cement.



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INSIDE *Slant*

WE'RE DOING ALL RIGHT

The oil industry has enjoyed considerable growth since the first issue ten years ago of "The Oil Producing Industry in Your State."

For example, the publication by the Independent Petroleum Assn. of America shows:

There were 675,789 producing oil and gas wells in the U.S. at the end of 1959, compared with 512,000 in 1949.

Proved reserves of petroleum liquids rose from 28.4-billion bbl. to 38.2-billion bbl. in the ten years, or 34.5%.

Production of petroleum liquids increased 45% from 2-billion bbl. in 1949 to 2.9-billion bbl. in 1959, and natural gas output rose almost 100% from 6.2-trillion cu. ft. to 12.3-trillion.

Although 1959 was not a record year for drilling, total wells exceeded the 1949 rate by almost 30%. The average depth of wells also increased. It was 4,092 ft. in 1959 against 3,538 ft. in 1949.

The value of total oil and gas production in 1959 was $9.6-billion, compared with $5.5-billion in 1949, an increase of 75%.

While the outlook may appear dark to some, we're still doing all right.

LeRoy Menzing
EDITOR

An everyday load. This B Model Mack is ready to take off cross country with typical cargo of oil well equipment.

Profit-making oil rig moves

start with PROFIT-MAKING TRUCKS

"This business would be a cinch if every job was as easy as picking my trucks," says M. T. Buckaloo who heads up Buckaloo Trucking Co., Kenedy, Texas, veterans of hundreds of oil rig moves. "Any job goes easier with good equipment, and ours is no exception. I figure you can't buy better than the best, so I stick with Mack trucks."

Overland trucking, loaded with drilling rigs, draw works and other heavy oil-field equipment, is all in the day's work with Mack trucks. You know your trucks have to be able to take it—and you can be sure they will if they're Macks.

The ability to get through—no matter what the weather or terrain—has made Mack the outstanding choice for tough oil-field service. Extra strong frames and chassis take jolt and shock in stride, and the Mack exclusive Balanced Bogie with Power Divider provides torque to the wheels with the best traction—gives Mack six-wheelers the ability to tackle the worst kind of going without bogging down.

Your Mack branch or distributor will be glad to show you why Mack trucks can save you plenty in terms of downtime, delays and headaches. Call him today. Mack Trucks, Inc., Plainfield, New Jersey. Mack Trucks of Canada, Ltd., Toronto, Ont.

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Big load is winched aboard. A Mack B-61 Model pulls derrick foundation onto low-boy trailer for move to next drill site.

Oil-field roads don't amount to much. Cross-country travel is all in a day's work for the Macks and men of Buckaloo Trucking.

Views That Make News

Dear Sir:

The Petroleum Comments column, "World Crude Price Postings Getting Shaky," [PW—Jul.22'60,p14] need not be so alarming. . . Crucial factors underlying the shaky price structure can be traced to either (1) an outmoded orthodox economic policy of most international oil concerns, or (2) uninformed native governments and personalities in the producing areas.

By accident or design . . . a handful of major overseas oil companies . . . bear the critical obligation vis-a-vis the everlasting mechanism of supply and demand, and the correlated price and other fluctuations in oil trade. They, not the ornamental Arabian sheikhs or the temperamental Latins, are facing the grudges of smaller independent producers and the increasing indignation of international consumers—not to mention the defamation of the trouble-making radicals and subversives.

If the oil executive quoted in the column "can no longer pretend that the present posting even remotely reflects the true market price," what prevents him from forsaking the orthodox, and hence impractical and decaying commercial policies, and adjusting to present day realities?

His production cost in such a fabulous area as the Persian Gulf, even with inflated administrative and other expenditures, is ridiculously low—some say 8¢ a bbl. in Kuwait. His proven reserves are tremendous by his own admission. His reinvestment is practically non-essential even at the existing low margin, which is being bitterly challenged by indulgent local fellows on the pretext of economy. He is faced with oversupply of products in a potenially very absorbtive world market (if the price is right), and he is faced with a very menacing intrusion of aggressive and competitive Russian production and marketing. . .

What pressure the major international producer faces is principally of his own making. He is either a greedy classical monopolist, or he is permitting himself to be intimidated by lusty, uncompromising, and irresponsible potentates and native technocrats. He knows only too well that they are incapable of performing and sustaining any serious responsibility even to their own grass-roots welfare, and that they are not intelligently informed and emotionally prepared to equate their basic economic and national well-being with the world market's requirements and highly articulate fluctuations. . .

OMAR K. HALIQ
Consultant
Arab economic affairs
Dusseldorf, Germany

"The U.S. Air Force consumed 5.9-billion gal. of aviation fuels during fiscal year 1960—8.5% more by volume than the 5.4-billion gal. required in 1945, the peak year of World War II. . . Jet fuel (JP-4) today represents more than 62% of the Air Force's total requirements for air and ground POL [Petroleum, Oils, Lubricants] supplies and 77% of the aviation fuel consumed."

—COL. WILSON A. CHAPMAN
Director
Air Force Directorate of Petroleum & Chemicals

"I hope that sooner or later we shall recognize the need of establishing quotas within Canada for exactly the same reason as the U.S. established them—namely, the need of encouraging oil development and selling more oil within our own boundaries."

—ARTHUR SMITH
Member of the Canadian Parliament

"We have enjoyed the freedoms of a democracy for nearly 200 years, but too many of us are beginning to be lulled into thinking that this freedom is guaranteed for the next 200 years. This attitude must be reversed. The solution is a well-informed and politically active citizenry."

—R. W. MCDOWELL
Chairman
Sunray Mid-Continent Oil Co.

"So far as our policy is concerned, oil is completely in the public sector. Proposals which come from the private sector have got to be considered in this background. The private sector knows that it has to accommodate the policy of the government of India. It therefore is for the private sector to consider how to fit itself in the pattern of our policy."

—K. D. MALAVIYA
Oil Minister
India

PETROLEUM WEEK will publish reader comments each week. Address letters to LeRoy Menzing, Editor, PETROLEUM WEEK, 330 W. 42nd St., New York 36, N. Y.

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Novel Aluminum-Insulated Tanks for Double-Duty Storage of Liquid Butane and Anhydrous Ammonia

The science of cryogenics is no more profitably applied than at St. Paul Ammonia Products, Inc., Pine Bend, Minn., where two 45,000 bbl. low-pressure, refrigerated steel tanks with multiwall aluminum insulation were recently placed in dual-service.

During the summer and fall, liquefied butane is stored at +25°F. During the winter and spring, anhydrous ammonia is stored at −18°F. The design pressure, in both instances, is 5 psig.

Thus, in summer when butane is more readily available, the two tanks preserve huge quantities of potential B.t.u.'s in a relatively small area, thanks to storage as a liquid at a low temperature and pressure. The butane is used by St. Paul Ammonia as a raw material for manufacturing anhydrous ammonia, which, in turn, is stored in the tanks for the spring, when demand from fertilizer users is heaviest.

A low operating cost is achieved by a completely automatic system of filling and emptying the tanks. Outer layers of aluminum to reflect the sun's rays provide an insulation that effectively aids in maintaining the desired temperatures. Asbestos Products, Inc., St. Paul, installed this novel insulation.

Designed, fabricated and field-erected by Graver, these two tanks represent one of many types of cryogenic storage and processing equipment Graver has been called on to design and produce. The opportunities for cutting costs and improving efficiency are substantial when the science of cryogenics can be employed. If there is an application in your operation, it will pay you to talk it over with Graver.

PIONEERS IN FABRICATING FOR APPLIED CRYOGENICS

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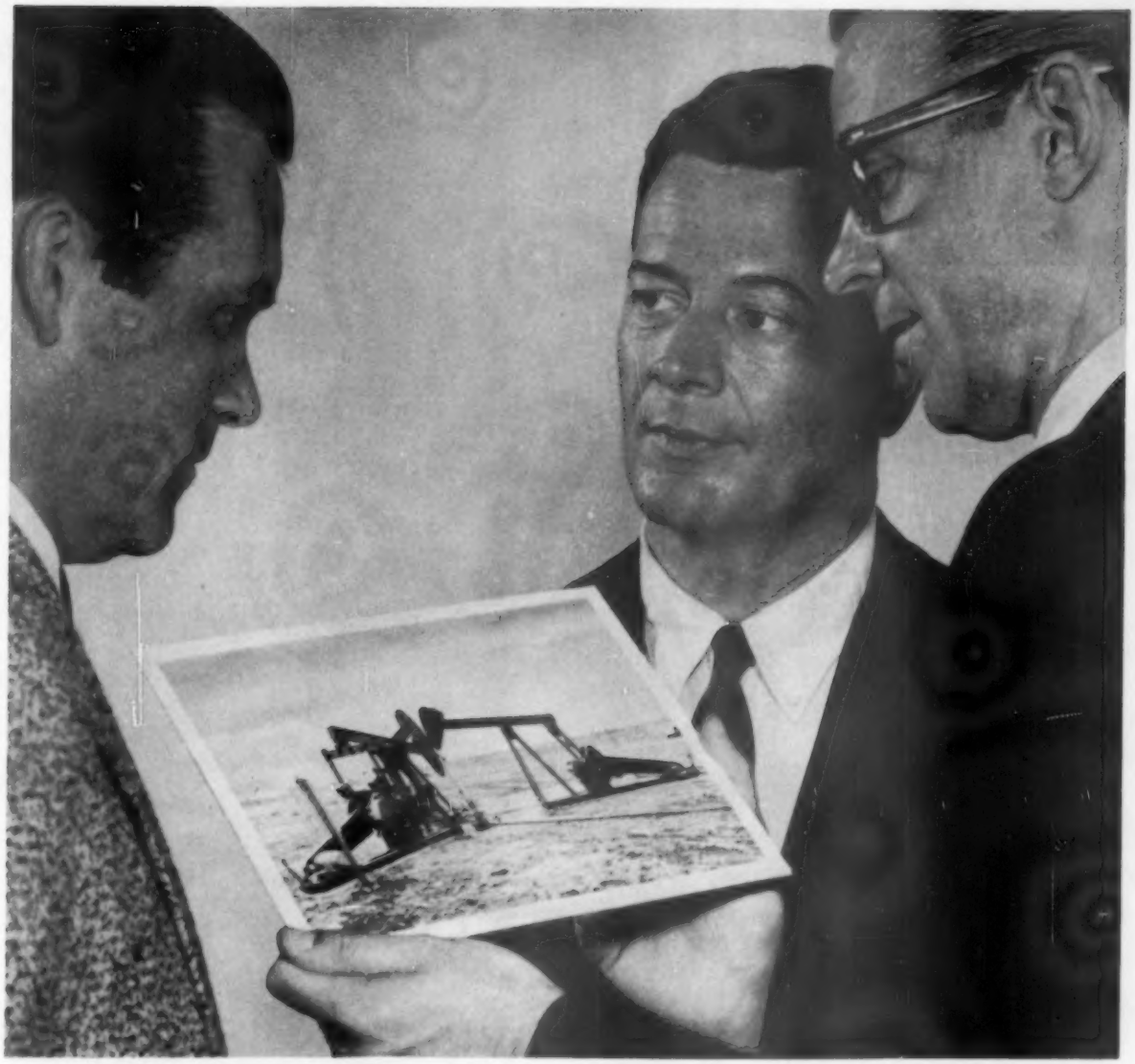

3 heads are better than 1 . . .

Often a utility electric power company engineer enters into a decision with one or more oil company engineers . . . effecting the economy of operation. This assistance is available anytime to oil producers, pipeline personnel or refinery engineers. As a matter of interest the triple pumper in the photograph pumps simultaneously from three producing zones.

Petroleum Electric Power Association
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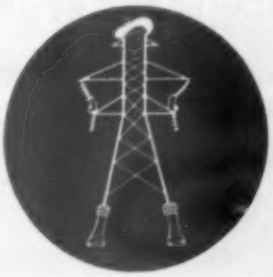
Utility Electric Power saves money, manpower, maintenance and serves you better automatically



A list of P.E.P.A. members will be furnished on request

another
TRETOLITE SERVICE
report

KONTOL
Corrosion Inhibitor permits low pH operation in refinery's crude unit overhead system

OHIO OIL COMPANY GETS EFFECTIVE CORROSION CONTROL, BETTER PRODUCT QUALITY AT REDUCED COST

An outstanding performance record compiled over a five-year period in Ohio's refinery at Robinson, Illinois, proves the feasibility of low pH operation augmented by KONTOL* Corrosion Inhibitors.

Prior to inauguration of the low pH-KONTOL program, a high (7.5) pH operation on overhead receiver waters was fouling equipment. Heavy sludge deposits were accumulating ahead of exchanger baffles, and ammonia was contaminating hydrocarbon streams. These troubles limited the refinery to short runs at decreased capacity. *In addition, serious corrosion problems resulted in extensive equipment replacement and repairs after only nine months of operation.*

By changing to a low (4.0-4.5) pH and injecting KONTOL Corrosion Inhibitor at a rate of 10-15 ppm, Ohio has stopped sludging and greatly lowered ammonia contamination. Equipment has been kept clean, reducing maintenance costs and permitting longer runs at increased charge rates. Turnaround inspection has been lengthened to 18-month intervals. *No equipment failures due to corrosion occurred during this five-year period.*

Low pH operation supported by KONTOL corrosion control might offer important advantages for your refining facilities. Ask the Man in the Red Car to explain this program, or write . . .

*Registered trademark, Petrolite Corporation

Facilities such as this one for Kontol injection at various points are part of over-all corrosion control program at Ohio Oil Company's Robinson, Ill., refinery.

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KR-60-1

The Continental is miles and miles from the heart of the oil country—but we're not as far away as the map would indicate.

Oil is a basic industry. So it's pretty basic that, as one of America's largest banks, we're active in oil.

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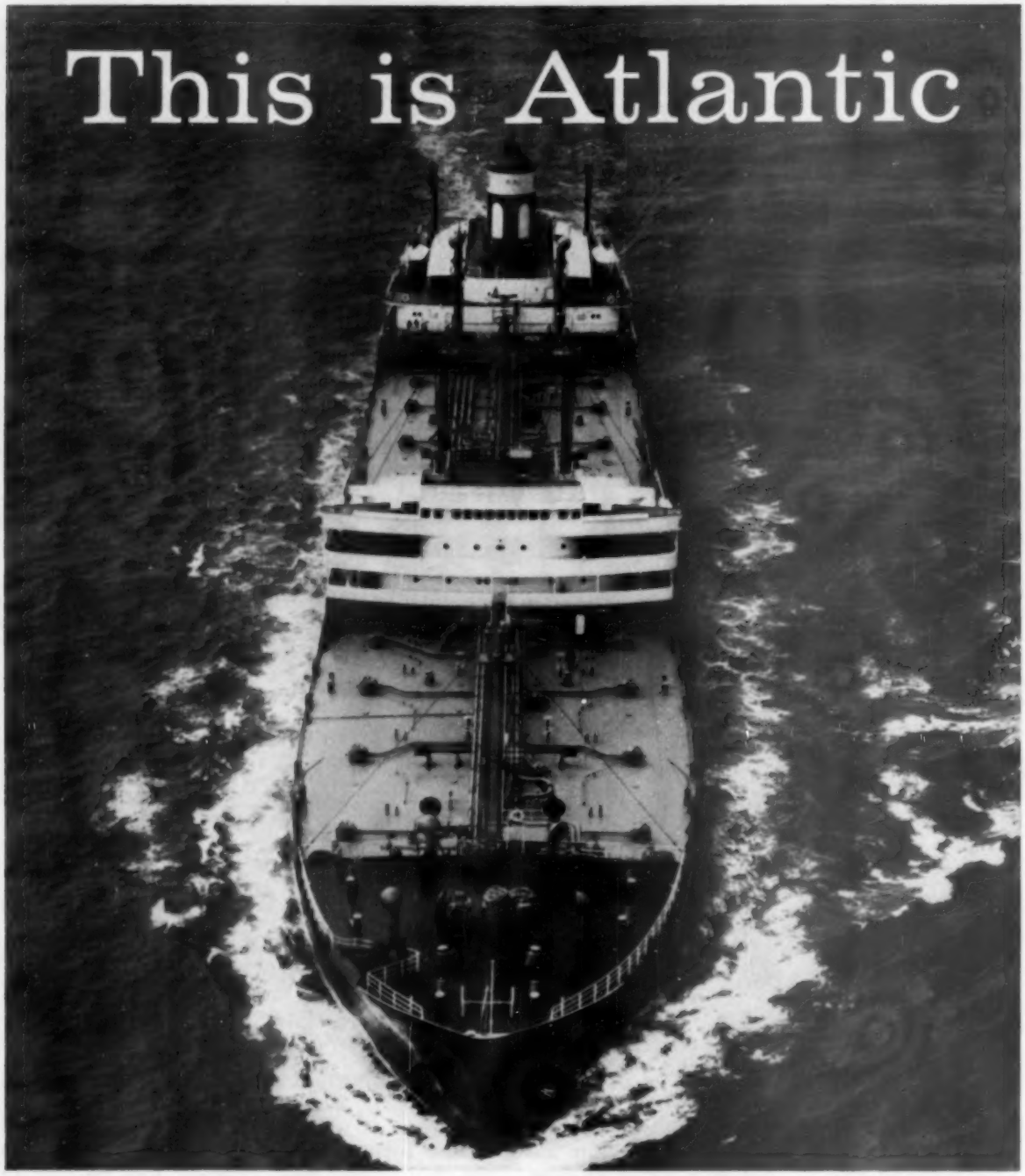

TRANSPORTATION: Settled low in the water, carrying a full load of quality gasolines... another Atlantic super-tanker links refinery areas with major consumer markets assuring distributors and dealers of a dependable supply at lowest possible cost.

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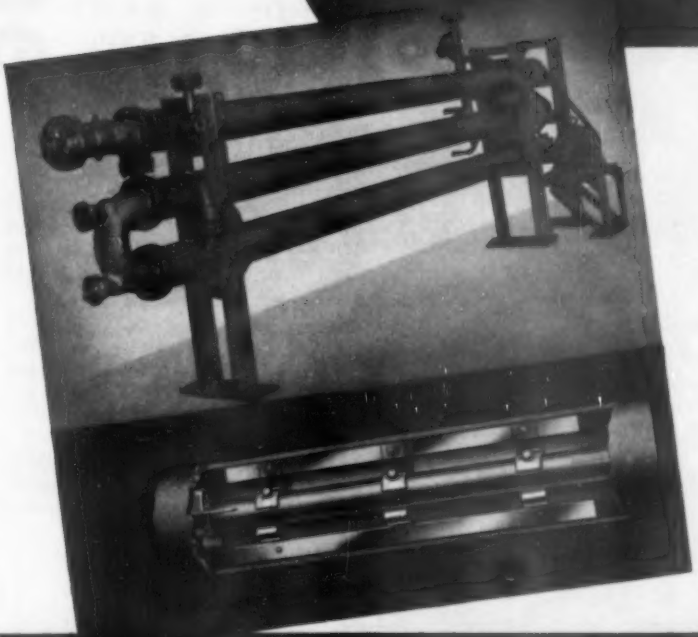

. . . And Here's How:

1. Rotating scraper action continuously sweeps surfaces clean even while processing highly adhesive materials.
2. Uniform rate of heat transfer keeps crystallization under control and discharges crystals as a slurry.
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4. Closed, pressure-type system permits use of flammable, volatile and expensive solvents with complete safety and no solvent loss.
5. Units fabricated from a broad range of materials to suit process stream characteristics.

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Polyester Liquid
Pressed Distillate
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Soybean Oil
Sperm Oil
Sugar Syrup
Sulfur-Oil Mix
Sulphate Solution
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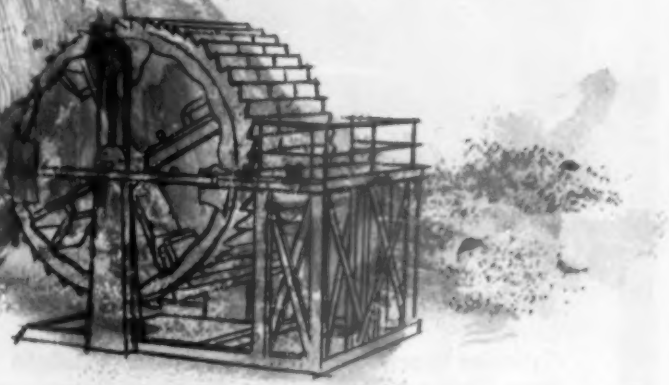
Tetrachloro Benzene
Viscose
Wax Slurry
Para-Xylene

HENRY VOGT MACHINE CO.
Louisville 10, Ky.

THE QUALITY OF THINKING

From an almost unlimited scope of thought, Leonardo da Vinci brought forth a stream of inventions which — in modern form — are in use today. However, Leonardo's greatest contribution was simply the triumph of creative thought applied to practical results. His work will stand for all time as proof that the appraisal of quality applies to thinking as well as to tangible objects and to visible or audible processes.

In a related sense, the quality of engineering is measured by results. And it is by results alone that the minds responsible for an engineering project can be evaluated. When you check the record of Brown & Root's engineering through the years, the high quality of thinking is self-evident. Customer satisfaction from greater efficiency at lower costs has built a worldwide reputation for engineering and construction by Brown & Root.



This squirrel-cage blower, invented by Leonardo da Vinci and put to practical use, was a significant step toward modern mechanical air conditioning.

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60-Second Summary / WHAT'S HAPPENING IN OIL

AT-A-GLANCE PETROLEUM WEEK Copyright

August 19, 1960

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There's no doubt now that the reduction in Middle East crude postings will stick. Shell and British Petroleum have followed Esso in making price cuts, Middle East governments' initial reactions were mild, but a delayed storm could be in the making. . . . p. 21

•

Custom-tailoring in the petrochemical business may be a wolf in sheep's clothing. Processors point out in a Petroleum Week Special Report that excessive specialization to fit the customers' needs can overburden plant inventories with a maze of only slightly different products. . . . p. 40

•

Radiation effects on plastics are being tested in France. One result: Plasticizers and stabilizers can keep plastics from discoloring under the influence of gamma radiation. . . . p. 66

•

The coal industry has scored again in the fight over residual fuel imports. The Interior Dept. set fourth-quarter import quotas at 415,000 b/d for Districts I-IV, turning a deaf ear to the pleas of importers and ignoring their arguments about thin inventories. . . . p. 22

•

A completely automated drilling rig is now being researched by the British. It holds promise of cutting trip time during drilling, which, in turn, will trim costs. . . . p. 28

•

Low state taxes are giving Missouri dealers a competitive edge. Dealers in neighboring states often have to lower profit margins to keep their prices at Missouri levels, and prevent customers from "border-hopping." . . . p. 99

•

The stage is being set for a major fight in Washington over tariffs and import controls. And oil isn't the only industry that is insulated from foreign competition by special laws and controls. . . . p. 19

•

Processors are adapting an old exploration tool—seismography—to refinery use. A new, on-stream equipment inspection method, called Ultrasonic, is based on the seismic principle. . . . p. 65

•

Will Venezuela actually bar a cut in its crude price postings? While the Oil Minister says yes, oil circles wonder; they see a contradiction in the text of his resolution on the price issue. . . . p. 81

•

Trucks are playing an increasingly important role in shipping crude. The reason: lack of pipelines in many producing areas. . . . p. 76

Up to the Minute / SIGNIFICANT LATE NEWS

August 19, 1960

Campagnie Francaise des Petroles canceled its $2.77-per-bbl. posting for Sahara crude at midweek, apparently pending clarification of the Middle East price picture. At the same time, the big French oil company compounded the Middle East confusion by reducing its postings for Iranian, Iraq, and Qatar crudes in varying amounts which differed from both the Esso and BP changes announced earlier (page 21).

Restlessness over the reductions in crude postings apparently is on the increase in the Middle East. Unconfirmed reports in Beirut at midweek indicated that an emergency meeting of the principal oil-producing countries may be in the works to discuss an Arab stand on the price cuts.

•

Natural gas from Canada will flow into California at the rate of 415-million cf/d in another year or two. Pacific Gas & Electric got the high sign from California's Public Utilities Commission this week to start construction of a 300-mi., 36-in. pipeline from the Oregon border to the San Francisco area. PUC approval eliminated the last legal barrier to the huge international project, which involves a 1,400-mi. pipeline from the Alberta fields and a total of 584-million cf/d for California, the Pacific Northwest, and Montana. The Canadian gas will cost 44.5¢ per Mcf. for the first year, delivered in San Francisco, compared with El Paso Natural's 39.5¢. PG&E is shooting for a 1962 completion of pipeline construction.

•

Another attempt to stir Senate action on the proposed fuels policy study withered on the vine this week. Sen. James Murray (D., Mont.) sent a revised version of the coal-backed resolution to the Senate Rules Committee, and urged its approval. At midweek, however, the Rules Committee had no plans for a meeting, and there seemed little likelihood that one would be called. Murray's revision eliminates language which oil industry circles had interpreted as meaning "end use" controls.

•

The Petroleum Equipment Suppliers Assn. put itself on record this week against any more oil shows or expositions. Formal notifications to that effect were sent to the presidents of the Tulsa International Oil Show, the Louisiana Gulf Coast Exposition, at Lafayette, and the Permian Basin Oil Show, at Odessa, Tex. The PESA board and membership adopted a resolution calling for discontinuance of the oil shows at its annual meeting, but deferred public action on it until this week. Spokesmen indicated that the resolution stemmed primarily from the tight profits picture.

•

The Federal Trade Commission isn't contemplating a slowdown in its investigations in the oil industry. Chairman Earl W. Kintner made that point abundantly clear this week at the Houston meeting of the National Congress of Petroleum Retailers. He said he'd "have some scalps" if it was proved that any FTC staffers had indicated the agency would ease up on oil probes.

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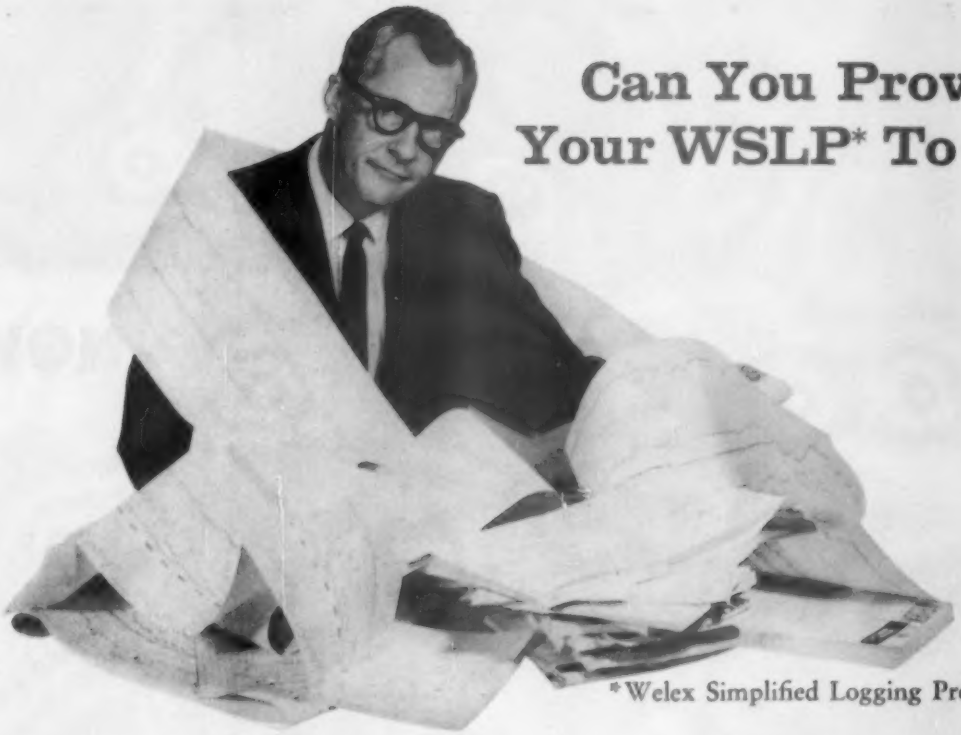

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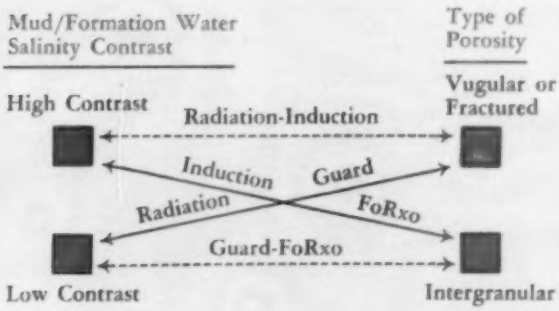

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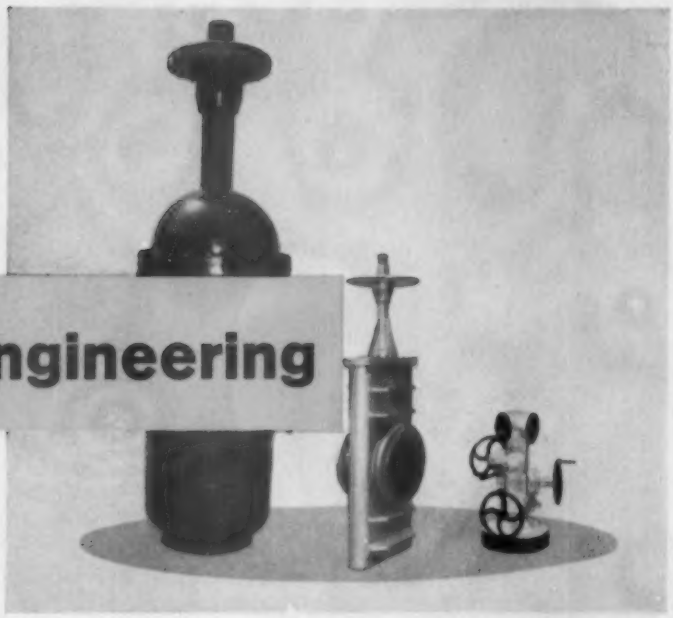

Left to right above, W-K-M's new: *Safe-T-Seal* Gate Valve (ASA); Pressure Sealing Gate Valve (ASA); Cross-type Triple Gate Valve (API).

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Are More Trade Controls the Answer?

A bitter fight over import controls, tariffs, and special protection laws is brewing in Washington. And it could develop into a real donnybrook in next year's Congress.

Back of it all is the mounting pressure of imports, which have taken 20-league steps in their growth in recent years (map, above).

The ambitious development programs launched in many countries across the seas—in effect, technical and economic revolutions in their own right—pose challenges the like of which American industries never have had to face before.

In the last decade alone, the dollar value of imports of all commodities has more than doubled. And since 1939, it has multiplied roughly seven times.

Like other U.S. industries, oil has a substantial stake in the outcome of the impending battle over trade rules and regulations, including special protection.

More and more, domestic manufacturers, fabricators, and producers of all kinds of goods are appealing directly to Congress for trade protection against the growing swell of imports.

So far, they have not been very successful. Neither the Senate nor the House has passed a bill specifically boosting a tariff in nearly 30 years.

But next year, the many dissatisfied groups of U.S. industries which have not received the kind of protection they feel they deserve will push the whole U.S. foreign trade policy to a head again.

Technically speaking, it's a long-range fight, for the current trade-agreements law does not expire until 1962.

When the 87th Congress convenes, however, protectionists and free-trade advocates alike are agreed that it will be the battleground for a complete review of existing laws.

The upshot could well be a new basic trade law to replace the present Reciprocal Trade Agreements Act.

Leading spokesmen of groups favoring less restriction agree with protection seekers that present laws do not meet the changing world economic conditions.

These include regional markets and customs unions, newly industrialized nations, and the problem of underdeveloped areas.

No one is predicting at this time that there will be a slowdown or reversal of the U.S. trend toward freer trade.

But one point is generally accepted: From now on, there will be more, not less, special consideration of particular industries hurt by foreign imports and international competition.

One relief proposal, for example, is embodied in the Democratic party platform. This calls for federal benefits in the form of tax advantages, subsidies, and other support for industries that can prove they have been injured by foreign imports.

The pros and cons of import controls and tariff regulations have stirred many oil men for years—but oil isn't the only industry, by far, that is insulated by law.

Special protection is already safeguarding certain U.S.-made products because of circumstances which Congress or the White House felt were injurious to domestic output.

These range from bicycles, watches, fur hats, lead, zinc, and copper, to dried figs and nuts (table, page 20).

Normal import controls include tariffs and quotas prescribed under the extended trade laws; so-called "Buy American" laws aimed at giving U.S. products an advantage in government purchases; and some subsidies, such as those given to U.S. shipbuilders.

Control measures also include protection against foreign patent infringements, products manufactured at lower foreign costs, and so-called

"peril points," below which U.S. trade negotiators may not reduce restrictions.

The items listed in the table, by contrast, are those which have received a special kind of treatment.

Tariff Commission "escape clause" recommendations enable the U.S. to renege on occasion from lower tariffs negotiated under the international General Agreement on Tariffs & Trade.

These too, are subject to revision and updating. So are findings of "dumping" by foreign suppliers at less than the fair value as set by the Treasury Dept.

Items granted special protection do not total anywhere near the number of requests for such special treatment, however.

By way of example, the ten escape-clause orders now in effect make up only one-third of the total number of cases in which the Tariff Commission has urged special protection. On the others, it was turned down by the White House.

And the 30 such recommendations made by the commission since the escape clause was written into the law in 1949 compare graphically with the 112 petitions from industry for competitive relief. In other words, only 9% of the appeals found their way into law.

Petroleum, to date, is the only product to win protection from the Office of Civil & Defense Mobilization, although more than a dozen applications have been filed.

This relief was granted on the contention that imports of foreign oil threatened national security and the ability of the domestic industry to retain its vigor.

Among the petitions turned down was that of U.S. manufacturers of hydroelectric equipment.

Still pending before OCDM are petitions from steam turbine and generator manufacturers, and U.S. manufacturers of transistors and other semiconductor devices.

Anti-dumping petitions, which are not made public before they are determined, run into the hundreds. They work this way:

When a U.S. producer obtains evidence that competing foreign imports are being sold at less than fair value in this country, he files a protest with the Customs Bureau of the Treasury Dept.

The bureau then checks the foreign prices and determines, by formula, what the exact value should be.

If this is higher than the price at which the goods are being sold in this country, the trade is alerted.

Most importers immediately freeze the item in question, because they are not sure how much duty they will eventually have to pay. The freeze isn't mandatory, but it is an accepted business practice.

The final duty is appraised after the Treasury Dept. fixes the foreign value and the fair value in this country, and the Tariff Commission determines whether or not U.S. competition is being injured.

Because the whole system of federal controls is so complex, and the opponents and proponents of free trade are equally vociferous, many business leaders undoubtedly are as confused as the general public.

In the field of government economic policy, probably no system of federal controls is more often misunderstood than the regulation of foreign imports competing with U.S.-made products.

In broad terms, however, the U.S. has followed a policy of lowering its trade barriers ever since the first reciprocal trade law was passed in 1934.

This law has been amended from time to time to provide for more administrative flexibility in setting up special protection for U.S. industries. Some feeling exists that it has been amended to death.

Whether it will be overhauled from top to bottom in next year's Congress, or merely amended again and again, is a question that only time will tell.

Special Protection Boxscore

From peanuts and cheese . . .
. . . to safety pins and bicycles

Product	Protection	Explanation
Watches, bicycles, and safety pins	Higher tariffs	Escape clause invoked to change negotiated tariff cuts on grounds of injury to domestic industry.
Dairy products, cotton, wool, oats, rye, barley, nuts, and similar items	Import quotas or special fees	Domestic products supported by the Dept. of Agriculture are subject to import controls.
Lead and zinc	Import quotas	Tariff commission escape clause invoked by White House.
Textiles	Export quotas on shipments to U.S.	Initiated voluntarily by Japanese government to minimize possibility of controls in U.S.
Dried figs	Higher tariffs	Presidential prerogative to use the escape clause.
Copper	Higher tariffs	Congress refused to extend legislation suspending import duties.
Spring clothespins	Higher tariffs	Escape clause prerogative.
Rubber-soled shoes	Higher tariffs	Congress passed special legislation.
Cast iron soil pipe and hardboard	Higher tariffs	Treasury Dept. held that foreign competition was "dumping" at less than "fair value."
Sugar	Import quotas	For three decades, Congress has split the domestic market among U.S. and foreign suppliers, at propped-up prices.
Hatters' fur and women's felt fur hats	Higher tariffs	Escape clause used to change a negotiated tariff cut.
Woolen fabrics	Higher tariffs on above-quota imports	White House exercised its right to exempt items from negotiated tariff cuts.
Stainless steel flatware	Special duties on above-quota imports	Presidential prerogative.
Clinical thermometers	Special duty	Presidential prerogative.

Shell, BP, Cut Middle East Postings

Join Esso in trimming prices for major grades. Reaction —so far—is mild, but there could be a delayed storm.

Middle East reaction to the reductions in crude price postings initiated by Esso Export Co. was more passive than positive this week.

But whether this was the real thing, or merely the calm before the storm, was a highly speculative matter.

The possibility of a delayed explosion was something that could not be ruled out at midweek.

Iran and Iraq particularly had been expected to hit the roof. But both governments refrained from immediate comment, even though they were known to be incensed because they had not been consulted in advance.

Through the Middle East, there was an ominous official silence, except for Saudi Arabia's Abdullah Tariki, who castigated the reductions acidly in an exclusive interview with PETROLEUM WEEK.

The Royal Dutch Shell group met the Esso price cuts on Monday, and within 24 hours British Petroleum and Mobil reduced their postings too, but by slightly lesser amounts.

Shell's cuts were retroactive to Aug. 9—the date of the Esso reductions (PW—Aug.12'60,p15)—but BP's were made effective Aug. 16.

Unlike the Shell and Esso reductions, which ranged identically from 6¢ to 14¢ for the major grades, the BP cuts ranged from 4¢ to 10¢. (Esso did have one 4¢ cut, but this applied only to Safaniya crude.)

The BP reductions, compared with Esso and Shell, were as follows:

Iranian heavy, 4¢ vs. 6¢;

Iranian light, 8¢ vs. 12¢;

Kuwait, 8¢ vs. 9¢;

Iraq crude for Persian Gulf loadings, 8¢ vs. 12¢;

Iraq crudes at Mediterranean ports, 10¢ vs. 14¢;

Qatar, 10¢ vs. 14¢.

This means that BP's new postings are 1¢ above Esso's for Kuwait crude, 2¢ higher for Iranian heavy, and 4¢ higher for other grades.

Mobil's postings are the same as BP's in most cases. On Iraq crude for Persian Gulf loading, it followed Esso's 12¢ cut. On Safaniya crude, it cut 3¢ compared with Esso's 4¢.

The moves by the four companies left no doubt that the price cuts would stick—but did leave some confusion over which level would prevail.

The fact that the price cuts were relatively small probably had much to do with the first passive reaction of the Middle East governments, however.

The price cuts will have only a nominal effect on their oil revenues.

In fact, oil payments to the five principal producing countries in the Middle East are expected to be about 7% higher this year than 1959, even after allowing for the reduced prices.

This is because the substantial increase in production in the Middle East this year will more than offset the price cuts.

Output in the key countries—Iran, Iraq, Saudi Arabia, Kuwait, and Qatar —was up 13% in the first half, compared with last year. And present lifting schedules indicate the total for the year will run about 11% over 1959.

In addition, the current reductions in postings will affect government revenues for only the last five months of the year—and only by 3¢ to 7¢ per bbl.

Concession agreements in the Middle East provide for payment to the governments of 50% of the crude production profits based on posted prices and irrespective of the discounts given by most companies.

Hence the reductions of 6¢ to 14¢ per bbl. in posted prices will affect the governments' take by only half of that amount.

Payments to the governments of the five main producing countries in the Middle East are expected to hit a record this year.

It is anticipated that they will amount to well over $1,335,000,000, compared with 1959's $1,250,000,000.

The estimates are based on anticipated production and exports for 1960 by the major companies. They do not represent actual payments as of the moment, however, since tax payments often lag several months behind output.

The estimates, moreover, do not include additional revenues from smaller producers, or extra payments made in the form of retroactive settlements of past claims.

Total oil revenues paid to the Middle East governments in 1959 were at a record high, despite the 18¢-per-bbl. reduction made in the early part of last year.

Saudi Arabia's oil director, Abdullah Tariki, reacted bitterly to the price cuts, and threatened to stir up retaliatory action. In a personal comment, Tariki told PETROLEUM WEEK:

"The price cuts are the worst thing that they could do to the oil industry:

"We refuse to recognize them."

Tariki said Saudi Arabia may decide to invoke its income tax prerogatives to offset the effects of the reductions. But he added:

"Before taking any action, we shall consult other producing nations.

"We already are in consultation with Venezuela and neighboring Arab governments on what should be done."

Tariki insisted that increased Russian exports of crude posed no real threat to Middle East oil.

Esso's initial statement, which discussed discounts as a whole, also pointed to Russian competition as a satellite reason for the reductions.

But the Saudi Arab countered that Russian exports in competition with Middle East crude "are too small to constitute a threat."

"Oil monopolies," he charged bluntly, "are using the Russian deals as an excuse to cut prices. The real reason is that the international monopolies want to buy our oil cheap."

He expressed belief that the latest round of price cuts made his global proration plan (PW—May6'60,p15) more imperative than ever, and that other producing countries would rally to its support.

The exact effect the Middle East price cuts will have on Venezuelan crude is still a bit puzzling, however.

Oil Minister Juan Perez Alfonzo has declared that his country would cut production and sales before it would allow itself to be involved in an international price war (page 81).

But now he says that the oil ministry will differentiate between "normal" and "abnormal" discounts on Venezuelan crude in considering the price reductions that the companies must offer to meet competition.

He explained this week that the Coordinating Commission for Conservation & Marketing of Hydrocarbons will permit discounts for "commercial" competition but not for "political" competition, such as the recent sale of Russian crude to Cuba.

Venezuelan producers, he went on, will be allowed discounts sufficient to offset the competitive advantage that other producing areas have in traditional Venezuelan markets, due to present low tanker rates. But discounts in excess of these will be considered "abnormal."

Interior Cuts Residual Quotas 5% Below Fourth Quarter of '59

The Interior Dept. ignored the pleas of importers this week, and set a fourth quarter level of 415,000 b/d for residual fuel oil imports into Districts I-IV.

The government decision brought varied reactions.

About the only aspect that satisfied all sides was the timing. The Interior Dept. finally succeeded in announcing the new figures 45 days before the beginning of the next residual import period, on Oct. 1.

The new allocations represent an increase of 165,000 b/d over current third-quarter authorizations (PW—Jun.10'60,p9), reflecting normal seasonal increases in demand.

Importing companies insist the new residual level is much too low—even less than 1959 imports.

The 415,000 b/d figure falls short of 1959, when actual residual imports in the fourth quarter were 434,441 b/d.

Irked importers point to the report by the Petroleum Industry Research Foundation, Inc., which stressed that imports of 560,000 b/d were essential to avoid East Coast shortages.

The foundation, supported by major oil companies and fuel oil jobbers, warned last month that residual shortages could develop if fourth-quarter imports were not boosted at least 29%.

The government decision represents a reduction from last year of almost 5%. And there appears little chance of a change.

The research foundation report, which paralleled the opinions of most major residual importers, said stock accumulation in the October-through-December period must be about 55,000 b/d to take care of normal inventory reductions from January to March next year.

Interior Dept. officials dismissed importer arguments about inventories. Lawrence J. O'Connor, new oil imports administrator, said certain importers have "overemphasized" the importance of the inventory situation.

He cited the industry's ability to import at a rate in excess of 700,000 b/d on short notice.

The same argument was made to a protesting New England delegation, which met last month with Interior Under Secretary Elmer Bennett.

Bennett indicated to the group at that time that he had no plans for recommending any major increase in the amount of residual oil to be imported.

Interior also served notice that, except under unusual circumstances, importers should not expect a residual allocation much higher or lower than actual imports in 1957.

In 1957, base year for the control program on residual oil, imports averaged 395,000 b/d during the fourth quarter.

O'Connor said that, in accordance with the presidential proclamation setting up residual controls, the base year 1957 was the "principal factor" considered by Interior in setting the new 415,000 b/d allocation.

The 1957 amount is considered the optimum level, O'Connor said, although future allocations may vary from time to time. But under normal circumstances, residual imports will not be fixed below imports for comparable periods in 1957, he said.

Interior promises to keep an eye on any moves to promote "artificial" shortages of residual oil this winter.

Said O'Connor: "The maximum import level was established after taking into account all facets of the residual fuel oil situation.

"In line with established policy, the department will maintain a continuing review of the residual fuel oil position to insure against the development of artificial shortages to normal consumers."

The new residual level comes close to that advocated by the domestic coal industry. Coal leaders had urged Interior not to exceed the 1957 level of 395,000 b/d. The new quarterly allocations are about 5% above that level.

The new allocations go to 32 importing companies. Only importers in Districts I-IV are affected by the new quarterly level.

Imports of residual into Puerto Rico and into District V were included in the six-month allocations issued in June.

Here are the company-by-company quotas for the fourth quarter:

Districts I-IV	Oct.-Dec. 1960	Jul.-Sep. 1960
Ashland	189	113
Atlantic Refining	329	198
Ballard Oil	3,549	2,139
Belcher Oil	1,912	1,152
Canadian National	24	14
Central Petroleum	3,722	2,243
Colonial Oil Industries	4,531	2,731
Copeland Terminals	15	9
Gulf Oil	2,444	1,473
Gustafson	534	----
George Hall	430	259
Hess	47,110	28,392
Inland Terminal	17	10
Kaneb, George T.	30	19
Metropolitan Petroleum	25,729	15,505
U.S. MPSA	1,663	1,003
New England Petroleum	10,314	6,216
Pure Oil	487	294
Royal Petroleum	3,038	1,830
Shell Companies[1]	26,245	12,717
Signal Oil & Gas	8,608	5,187
Sinclair Oil	346	208
Socony Mobil	307	185
C. H. Sprague & Son	26,021	15,682
Standard (Calif.)	770	464
Standard (Ind.)	26,241	15,814
Standard (Ky.)	13,392	8,071
Standard (N.J.)	126,116	76,005
Steuart Petroleum	4,720	2,844
Texaco	66,892	40,313
Whole Oil[2]	----	219
White Fuel	9,275	5,590

[1]Includes Buckley Bros. [2]Delayed Allocation.

Forecast: Fewer Fuel Blends

A majority of the automobile engines of the future may be designed to operate on a single grade of a wide-boiling-range fuel.

That's one prediction that was made this week at the Society of Automotive Engineers national meeting at San Francisco.

The estimate was made by J. H. Pitchford, managing and joint technical director of Ricardo & Co., Ltd., Sussex, England. His forecast of future automobile engines is:

- For the small and medium car, more and more refined developments of the spark-ignited gasoline engine will continue for a long time with a tendency for compression ratios to settle around 12-1.
- For automobiles for commercial use, there will be a rapid extension of the use of diesel engines.
- For the larger type of passenger car, the gas turbine will move into the field with growing momentum.
- For heavy transport vehicles, particularly those operating under the most nearly constant speed and load conditions, gas-turbine power plants also will win favor.

A simplification in world-wide fuel blending, transport, and distribution "could well be of such magnitude as ultimately to effect substantial reductions in cost to consumers and increased profits to the oil industry," he observed.

Six Oil Companies in Top Ten Firms

Petroleum companies dominate the first ten of the 100 largest manufacturers in the U.S., with six.

The listing, compiled by the First National City Bank of New York, placed Standard Oil Co. (N.J.) with total assets of almost $9.9-billion at the end of 1959 as the largest U.S. firm (table, right).

It was ahead of second-placed General Motors by $2-billion. Ford Motor Co., in fourth place, was the only other automotive firm in the first ten companies.

Membership in the "Hundred Largest Club" at the end of 1959 required a minimum of $378-million in assets, or more than two and one-half times the entry fee in 1949.

The increase in the requirements to stay in the blue ribbon list of corporations resulted in 15 firms dropping from the list since the end of 1949. On the average, First National City Bank noted, the 15 firms excluded from membership in 1959 expanded by 52% in the past decade—but still not enough to keep pace with the leaders.

The total assets of the 100 companies amounted to $116-billion in 1959, up 137% over 1949.

Of the 15 firms now included in the first 100 that did not make the list ten years ago, six are in the aircraft and missile field.

The number of manufacturers with assets of more than $1-billion doubled between 1949 and 1959.

The 21 petroleum companies in the listing of 100 largest manufacturers topped all other categories of firms in their average investment per employee—at $62,000, three times the average for all groups.

Second to the petroleum industry in average assets per employee were distillers, whose investment averaged $53,000 per employee.

The average amount of assets per worker for all 100 companies grew from $12,200 in 1949 to $20,900 last year, the bank reported.

Total sales of the 100 largest firms of $128-billion in 1959 were more than double 1949, but profit margins shrank by one-fifth.

Only 6.4¢ of every dollar of revenue, on the average, was carried down to net profits in 1959, compared to 7.9¢ in 1949.

Payroll costs took 27.5¢ in 1959, up from 23.1¢ out of every revenue dollar in 1949.

Total Assets at End of 1959 in Millions of Dollars

Jersey Standard	**$9,895**	**Texaco**	**$3,348**
General Motors	**7,908**	**Socony Mobil**	**3,347**
U.S. Steel	**4,712**	**Du Pont**	**3,011**
Ford Motor	**3,905**	**Indiana Standard**	**2,847**
Gulf Oil	**3,576**	**California Standard**	**2,578**

Total Assets of 100 Largest Firms

(in Millions of Dollars, end of 1959)

Allied Chemical	$ 785	Kennecott Copper	$ 803
Allis Chalmers Mfg.	528	Liggett & Myers Tobacco	404
Aluminum Co. of America	1,360	Lockheed Aircraft	521
American Can	860	Minn. Mining & Mfg.	379
American Cynanamid	630	Monsanto Chemical	742
Amer. Rad. & Std. Sanitary	378	Natl. Dairy Prod.	642
Amer. Smelt. & Ref.	444	Natl. Distillers & Chem.	509
American Tobacco	807	National Lead	381
Anaconda	1,080	National Steel	863
Armco Steel	1,022	North American Aviation	381
Armour & Co.	398	Ohio Oil	463
Atlantic Refining	808	Olin Mathieson Chem.	839
Bendix Aviation	385	Owens-Illinois Glass	492
Bethlehem Steel	2,269	Phelps Dodge	417
Boeing Airplane	595	Phillips Petroleum	1,580
Borg-Warner	445	Pittsburgh Plate Glass	619
Burlington Industries	526	Procter & Gamble	860
Caterpillar Tractor	536	Pure Oil	554
Celanese	397	Radio Corp. of America	811
Chrysler	1,375	Republic Steel	1,034
Cities Service	1,298	Reynolds Metals	955
Colgate-Palmolive	378	R. J. Reynolds Tobacco	853
Continental Can	751	Richfield Oil (L.A.)	433
Continental Oil	788	St. Regis Paper	455
Corn Products	424	Schenley Industries	497
Crown Zellerbach	586	Shell Oil	1,767
Deere & Co.	622	Sinclair Oil	1,494
Distillers Corp.-Seagrams	562	Singer Mfg.	523
Douglas Aircraft	460	Skelly Oil	394
Dow Chemical	859	Socony Mobil Oil	3,347
E. I. du Pont de Nemours	3,011	Sperry Rand	849
Eastman Kodak	916	Standard Oil of Calif.	2,578
Firestone Tire & Rubber	854	Standard Oil (Ind.)	2,847
Ford Motor	3,905	Standard Oil (N.J.)	9,895
General Dynamics	861	Standard Oil (Ohio)	409
General Electric	2,561	Sun Oil	743
General Foods	513	Sunray Mid-Cont. Oil	582
General Motors	7,908	Swift & Co.	554
B. F. Goodrich	559	Texaco	3,348
Goodyear Tire & Rubber	1,002	Tidewater Oil	856
W. R. Grace	530	Union Carbide	1,632
Gulf Oil	3,576	Union Oil of Calif.	707
Inland Steel	826	United Aircraft	531
Intl. Bus. Machine	1,466	United Fruit	385
Intl. Harvester	1,145	United State Rubber	659
Intl. Paper	949	United States Steel	4,712
Intl. Tel. & Tel.	932	Western Electric	1,475
Jones & Laughlin Steel	829	Westinghouse Electric	1,498
Kaiser Aluminum & Chemical	786	Weyerhaeuser	611
Kaiser Steel	475	Youngstown Sheet & Tube	716

Source: First National City Bank of New York

These Bendix-Pacific remote control, alarm and telemeter systems have conclusively demonstrated their money-making efficiency and reliability – paying out from within a few months to less than 3 years – without exception.

Built on the "building block" principle Electro-Span Systems have 15 years experience behind them in engineering and liaison work which guarantees satisfactory operation for the specific requirement.

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What's New / IN THE INDUSTRY

Plans for a 52,000-ton atom-powered oil tanker are being pushed in Italy. A research and development program has been whipped up by the Italian National Committee on Nuclear Research, the Fiat Co., and the Ansaldo Shipyards. The group hopes to obtain technical and financial help from Euratom for a two-year period, during which blueprints would be completed.

•

Hess Trading & Transport, Inc., reportedly paid $3.5-million for Gulf Refining Co.'s Mobile (Ala.) storage terminal and 152-mi. pipeline. The 42,000 b/d, 10-in. and 14-in. line—longest steam-heated line in existence—gathers low-gravity oil from the Heidelberg, Eucutta, Yellow Creek, and Baxterville fields in Mississippi, and transports it to Mobile. Scurlock Oil Co., Houston, is associated in the purchase, scheduled to become effective Sept. 1. Capacity of the storage unit is 480,000 bbl.

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An item for the bookshelf: E. B. Swanson has finished compiling a descriptive bibliography of "A Century of Oil & Gas in Books." Sponsored by the American Petroleum Institute, the book is offered by Appleton-Century-Crofts, Inc. It cites well over 2,000 items published in book form in English.

•

Another oil company has been bitten by the diversification bug. Carl T. Long, president of Crestmont Oil Co., Burbank, Calif., says his firm has acquired certain electronic devices for industrial and military use, and that negotiations are under way for acquisition of an electronics firm. Crestmont, up to now, has been engaged solely in exploration and production, mainly in Texas and California.

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Louisiana's September-October allowable will be about 970,000 b/d—up slightly from the July-August allowable of 962,738 b/d. The state's new conservation commissioner, James H. Gill, says the permissible for September-October will be 33% of the depth bracket formula, unchanged from July-August. Official allowables for the next two months will be set next Tuesday. Oil company nominations totaled 862,829 b/d.

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National Safety Council awards went this week to the Natural Gasoline Assn. of America, and the Oil Field Haulers Assn. They were among ten associations, representing various industries in the U.S. and Canada, that were cited for the excellence and balance of their safety programs.

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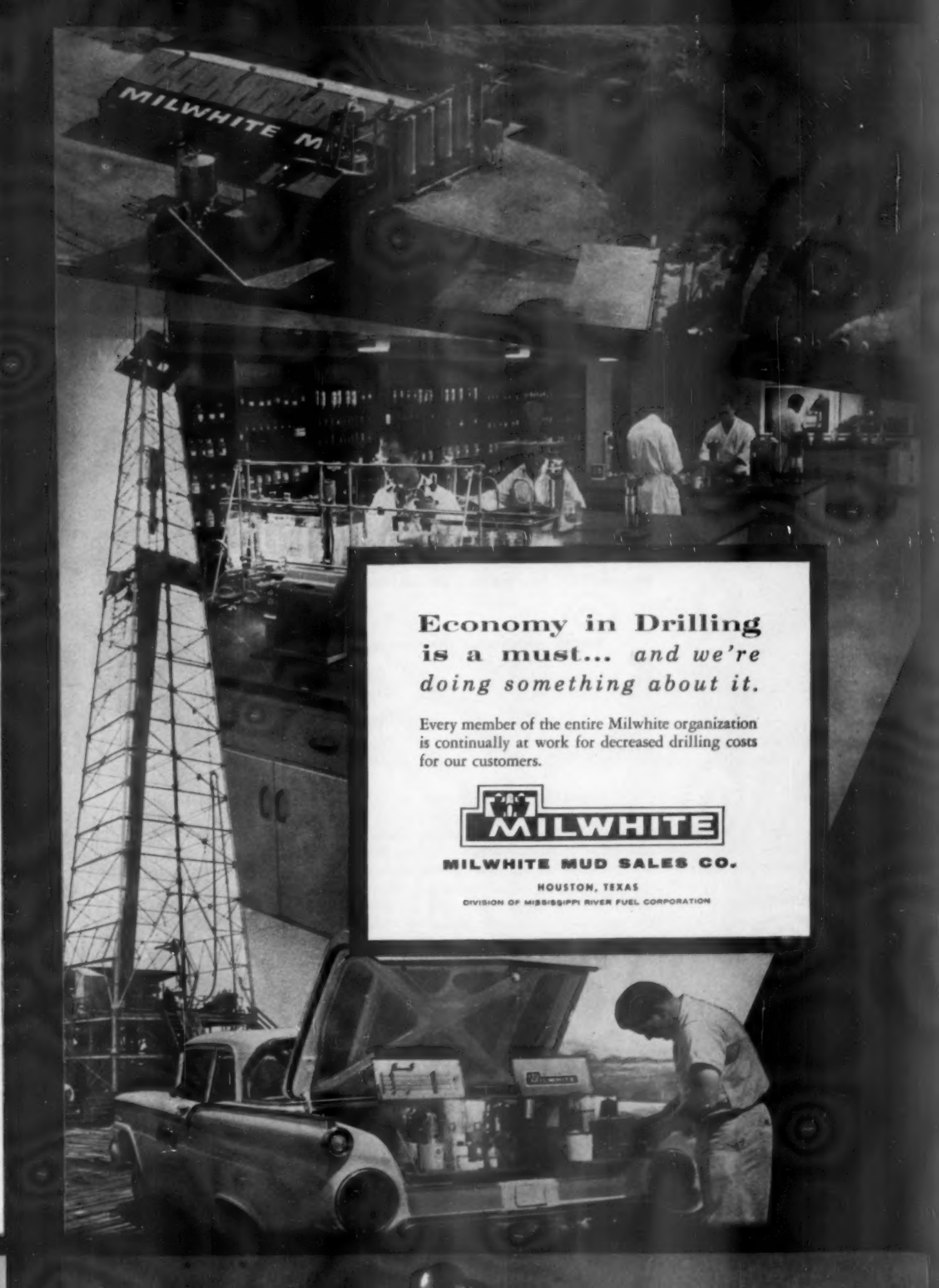
Osgood V. Tracy

Osgood V. Tracy has been elected a director and executive vice-president of W. R. Grace & Co. in charge of its chemical business. The appointment is effective Sept. 1. Tracy retires this month as president of the Esso Standard division of Humble Oil & Refining Co., after 30 years with the company. Tracy will be responsible for Grace's seven operating divisions and the research division comprising the Grace Chemical Group. He succeeds the late Marlin G. Geiger. Tracy was also president of Esso's petrochemicals marketing affiliate, Enjay Chemical Co., from 1952 to 1958.



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HOUSTON, TEXAS

DIVISION OF MISSISSIPPI RIVER FUEL CORPORATION

Looking Ahead in Washington

McGraw-Hill
Washington
Bureau
August 19, 1960

The Phillips case is hanging as the Federal Power Commission ponders the circuit court's El Paso decision on tax treatment. Washington observers thought they saw evidence FPC was about to rule on the important Phillips case until last week. Then the New Orleans appeals court ruling hitting at the treament of depletion and intangible drilling costs came in (PW—Aug.12'60,p12). Now all signs point to the commission reviewing all sides of the producer regulation issue.

One FPC reaction seems to emerge. The commission feels it will now have to work inside some fairly narrow boundaries. That's the reality, the inside reporting goes, regarding the El Paso case (remanded to FPC by the New Orleans court) and the Phillips case (sent down from the U.S. Supreme Court) as well.

The main restraints on FPC, as seen in Washington:

The circuit court precisely describes El Paso, a pipeliner and producer, as a "regulated public utility." The argument by Phillips and other producers is that they cannot live by utility regulation while being, in actuality, in competition with other gas producers.

The court tells FPC that the tax provisions for intangible drilling costs and depletion can't be used in determining costs for rate-making. Phillips, in its amended argument before the commission, seeks the right to use the tax provisions—figuring them as though the taxes had actually been paid—in arriving at a rate for the gas it sells.

•

Speculation on what the commission will decide is broad, naturally. First, on the El Paso case, the lower court ruling can be appealed to the U.S. Supreme Court. But many lawyers think the Supreme Court would not accept the case. And, because the commission is a man short (no successor for William Connole has yet been seated, and new member Paul A. Sweeney will exclude himself on the Phillips ruling), the Phillips decision will be made by only three men.

•

Something equally important to keep in mind: The circuit court's ruling is not aimed at intangible drilling and depletion when actually paying income tax. There has been some talk in Washington, at least, that the court had "made some law" for the Internal Revenue Service. Those who fear the decision will affect a company's tax-paying situation argue this way:

If you set up a proposition that a rate of return on gas obviously will affect the gross receipts of a company, then that company will have smaller base revenues from which to use the 27.5% depletion provision.

But says a government expert: "I've heard a lot of arguments on this subject, and this one really comes from left field."

Says a company expert: Anyone who thinks a producer's dealings with IRS are affected "doesn't know anything about tax law."

The explanation from tax specialists: A producer's dealings with IRS concern his entire operations, oil and gas, regulated and unregulated. The regulated gas part is generally a fairly small fraction of the average producer's business. So a producer takes account of his intangible and depletion provisions and then, when FPC is examining his operations to establish rates, those provisions are not a factor in establishing cost of service. That is the Fifth Circuit Court's contribution in the El Paso case.

brass tacks

FROM HALLIBURTON

FRACTURING FACTS

The cable tool crew was very disappointed when tests showed this shallow well in Eddy County, New Mexico to be a dry hole. Halliburton was called to do a Sandoil Fracturing Job using 79,550 gallons of lease crude and 2,800 sacks of sand. Injection of approximately 7,600# of sand/per minute was easily accomplished with Halliburton's versatile pumping, proportioning, and bulk sand handling equipment. After recovering fracturing oil, the "dry" hole tested out at 121 bbls./day.

This old well in Jackson County, Texas could not be produced because sand and shale continually flowed into the hole. With Halliburton's Fracpac technique, 28,000# of 20-40 and 2,000# of 10-20 sand was pumped into the formation and well bore to serve as a filtering medium. A liner was then inserted to retain the filtering sand. Since treatment 34 months ago, the well has produced 22 bbls./day. Numerous other wells in this same area have also been converted to profitable producers by this technique.

After completing this new Tensleep well in Hot Springs County, Wyoming for 35 bbls. water with trace of oil, operator was about ready to abandon. He talked to Halliburton and decided to squeeze perforations with 100 sacks of Pozmix Cement, then re-perforate with Halliburton Hydra-Jet. After squeezing four holes were placed in each of three intervals 3261-67. 250 gallons of Halliburton Mud Cleanout Agent (MCA) was spotted opposite the intervals and pumped into the zones to clean the formation. Production 1½ months after treatment was 112 BOPD and 238 BWPD.

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Automatic Drilling Rig Is Being

The English are working on a completely automated drilling rig as a means to cut trip time during drilling and thus trim expenses.

Hew D. Fanshawe, in a report to the Institute of Petroleum in London, said that, as more and more effort is put into increasing penetration rate, pipe handling becomes more important, especially as the search for oil goes deeper.

In his report, Fanshawe described research being done by England's National Research Development Corp. and Dowty-Rotol, Ltd., and the details of an automated rig as envisioned by Dowty-Rotol.

A rig design being researched by Dowty-Rotol, Ltd., features two independent lifts arranged so the weight of the drilling string can be transferred from one to the other "on the fly."

This way, Fanshawe said, pulling could be carried on without any stops.

All that is necessary, he pointed out, is to mount automatic breakout and spinning mechanisms on the lifts themselves so that these can operate while pulling is in progress.

Fanshawe referred to a 1956 PETROLEUM WEEK article in which a detailed description of an automated rig was outlined (PW—Jun.8'56, p18).

This got our automated rig over a difficult moment, he said.

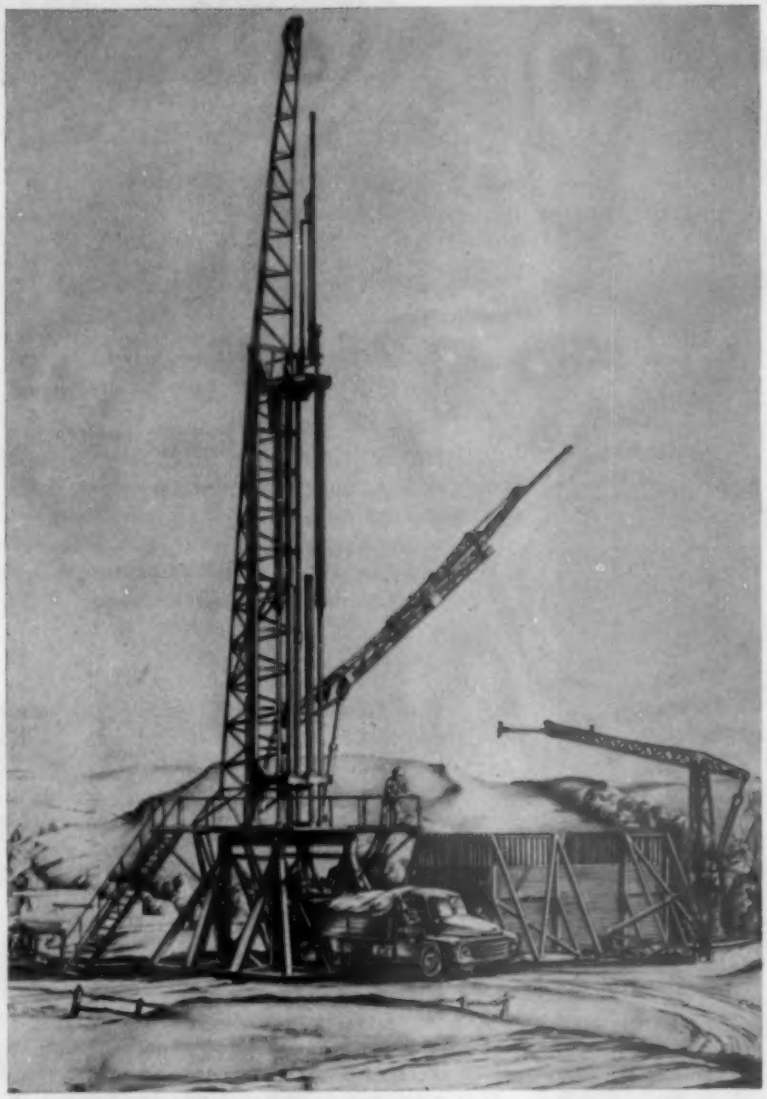
The PETROLEUM WEEK article featured an idea of Philip L. McLaughlin, drilling research director at Cardwell Mfg. Co.

McLaughlin's theory was much like the one pursued in the English design: a short compact unit that supports, hoists, and rotates the pipe, and makes up and breaks out the joints, which would be picked up by a racking arm operated by the derrickman.

The English rig design consists of a lightweight, 33-ft. jib for cat-line and sand-line sheaves, surmounting a 47-ft. guide structure, which carries only lateral loads.

These are transmitted to the pair of channel-section guides by rollers on each of the lift platforms, upper and lower, which are actually trolleys on vertical rails.

The power house is connected to the rig by fluid lines only so the normal substructure can be small.



ARTIST'S CONCEPTION of English rig design said to offer big cuts in trip time.

The drillpipe passes centrally between the twin pairs of main hydraulic rams, which are ball-jointed to the substructure and lift platform.

Each lift has a traveling distance of 19 ft. The lower lift carries slips. The upper lift carries slips or elevators, break-out mechanism, and a spinning mechanism that can raise and displace sideways a joint of pipe or a drill collar.

These mechanisms and racking arms are fully automatic, since they must operate fast to achieve the top continuous pulling speed of 4 ft. per second. This means each must cycle in about 7 seconds.

During round trips, each lift pulls half a joint-length alternately, accelerating before and decelerating after transferring the weight of the drill string.

The lower lift grips below each tool joint as it appears through the rig floor, hands it "on the fly" to the upper lift, which has descended be-

Studied in England

yond the midway point and is now traveling upward with the pipe.

At this instant, an entire joint of pipe is projecting above the upper lift, which pulls another 15 ft. while breaking and spinning out the projecting joint.

As the upper lift approaches the top of the guide structure, the lower lift has dropped to take a new grip below the next tool joint.

The upper lift disengages, displacing the loose joint sideways, and then returns down to the midway point.

There, it hands the loose joint to the transport arm, which in turn hands the joint to the racking arm for indexing into its slot in the rack.

During drilling, the elevators on the upper lift are replaced by a hydraulically driven power swivel.

The swivel, which is slung from the same attachment points, transfers automatically to the lower lift as it reaches the midway point on its downward trip.

Singles are added between the separated lifts by shortening the linkage on the transport arm.

In handling casing, standard elevators and tongs would be needed.

The pipe-handling tools on the rig can be adapted to handle pipe up to 8⅝-in. OD semi-automatically.

The rig is powered hydraulically.

The main power in the hydraulic system is switched to the lifts alternately for pulling pipe.

For drilling, it is directed to pressure exchange diaphragm slush-pumps. One motor-pump unit is reserved for the auxiliary hydraulic system, which drives the power swivel or, when tripping, maneuvers whichever lift is unloaded, and which powers all pipe-handling tools.

Economically speaking, an operator using the rig would about "break even" at depths of around 5,000 ft., and would reach savings of 10% to 15% at depths in the 8,000- to 10,000-ft. range.

The big advantages it offers, Fanshawe said, are the crew and time savings in round-tripping.

Given the same prime movers as a conventional rig, he added, the automated rig could complete a trip in less than one-third the time required by the conventional rig and methods.

For example, Fanshawe pointed out, with 1,200 effective horsepower, a trip from 16,000 ft. would be completed in less than 3 hours.

For deep drilling, capital cost of such a rig would be comparable to that of conventional rigs, but maintenance cost would be less.

All the operations of drilling, Fanshawe said, would be performed by one power swivel and one spinning motor (the only rotating parts outside the power house) and 23 double-acting jacks.

These would include four main jacks, ten operating jacks, and nine small gripping jacks.

The chief English emphasis—speed—contrasts with that of an automated rig operated by Humble Oil in 1948, on which the main concern was the easing of crew fatigue to increase efficiency and safety.

Humble approached the automation theory with the idea that, with automatic equipment, crews could concern themselves with the operation of the rig rather than lend muscular assistance to it.

The Humble rig featured fully automatic power tongs and automatic racking arms in a conventional derrick that could handle three joints of pipe.

In operation, the automatic tools took over once the stand was pulled up into the derrick.

The tong operator would then use his eight controls to maneuver the hydraulically powered tongs onto the pipe and separate it from the joint being held by the hydraulic slips.

When the stand was broken out, the tongs would swing around and hand it to the lower racking arm.

While this was being done, the derrickman would release the elevators and control the upper racking arm as both ends of the stand were racked simultaneously.

Humble's rig was used for development drilling to depths of nearly 10,000 ft. in the company's Sugar Valley field, but was later stacked.

In East Texas . . .

12th Smackover Pay is Added

The recent Smackover discovery in Hunt County—the county's first—brings to 12 the number of Smackover pay areas in East Texas.

The Hunt discovery is Paul C. Teas No. 1 J. H. Cambliss, Mary Latham survey, 4 mi. northeast of Quinlan townsite.

It is in the old Ashby-Ramsey Woodbine area along the Mexia-Talco fault system. The nearest Smackover production is some 40 mi. northeast along the fault at Sulphur Bluff in Hopkins County.

The Hunt County wildcat was completed for 4.7-million cf/d of gas and 59 bbl. of condensate per million through 20/64-in. choke.

The gas has a sulfur content of 2%. The condensate is 63-gravity.

Some 37 net ft. of Smackover pay was logged after being topped at 8,966 ft. Perforations were at 8,975-95 ft.

A few days earlier, Wood County got its first Smackover discovery.

Pan American Petroleum Corp. No. 1 J. B. McKee, Oscar 3 & Engledow survey, 4 mi. northwest of Yantis townsite, was completed for 9.1-million cf/d of gas and 121 bbl. of 60-gravity condensate per million through ½-in. choke and perforations at 12,765-95 ft.

No. 1 J. B. McKee is 6 mi. northeast of the shut-in, one well Ginger (Buckner) field of Rains County.

The thirteenth Smackover discovery for East Texas has been indicated in Cass County, 6 mi. northeast of East Linden (Cotton Valley) field.

This prospect, H. L. Gist and Pan American No. 1 Grant Unit, Lavinia Moren survey, at last report flowed 424,000 cf/d of gas, 22 bbl. of 49-gravity condensate, and 20 bbl. of salt water through ⅜-in. choke and perforations at 11,143-48 ft.

Two more Smackover wildcats currently are being drilled in Hunt County.

Edwin L. Cox is drilling No. 1 W. O. Hill, James Cole survey, 2 mi. north of Campbell townsite and 18 mi. northeast of the Teas discovery.

Leland Fikes has started No. 1 Spencer, James McAdams survey, 5 mi. southwest of the Teas well.

Both of these are along the Mexia-Talco fault system.

How Independents Can Cut Office Costs

Core Laboratories, Inc., has set up a computer service aimed at eliminating most field office clerical work for independent producers.

The system can cut in half the production accounting cost of the average independent producer, Core Lab says.

Raw field data such as field gauges and daily lease reports are converted by electronic computers into all the engineering reports the operator needs for his own use—including those required by regulatory agencies.

If utilized to its fullest extent, the system is said virtually to eliminate all paperwork done by field office personnel in preparing engineering accounting reports.

This means field office overhead is reduced and engineers are free "to do engineering instead of production accounting clerical work."

A producer can preprocess data by having field office personnel put the information in form for a computer. But, Core Lab believes, those using its "Computerized Production Accounting" programs for converting the data for computer input will realize the greatest benefits.

The system can work from such basic data as field gauges, lease reports, pipeline run tickets, gas and LPG sales, gas meter charges, fluid injection measurements, well test reports, pressure test records, gas contract provisions, proration schedules, tank tables, allocation formulas, sales prices, production taxes, and transportation charges.

Programming—one of the more expensive features of any data processing service—is by-passed,

The producer is spared this expense, which can easily reach $200,000, Core Lab says, because the service stems from an engineering data processing system programmed for Core Lab's own operations.

Using this system as a base, Core Lab tailors an accounting program to fit the individual needs and desires of others.

The company says any firm with production data handling costs of $200 per month probably can save money.

"We aren't getting into routine bookkeeping work yet," says Sam Dunlap, sales vice-president, although the information we make available to the operator helps his auditor.

An average operator can use the service for all of his engineering accounting needs at a nominal cost per well.

The per-well cost declines as the number of wells increase. Core Lab negotiates with each producer on actual cost since fees vary with the amount of work involved.

For this cost, the operator gets such typical reports as production and injection summaries, fluid inventories, current reserve status, and graphical illustrations of production, injection, and pressure history.

The basic programs can be refined further to signal various types of abnormal well behavior, fluid injection flood pattern progress, and pressure anomalies.

The basic data and processing results are stored on cards or magnetic tape. Since tabulation of any of this information is available upon request, the producer can reduce his own filing requirements.

Each producer gets a program code. From there on, all basic data forwarded to Core Lab are coded with respect to operator, source, field, lease, along with exact processing requirements.

Report accuracy is said to be improved since the data are handled only twice—when originating in the field, and when punched into data processing cards.

Core Lab has an International Business Machines 650 computer and supporting peripheral equipment in its data processing center. The 650 computer will be replaced by either an IBM 653 or a still faster IBM 704.

Gulf Cement Won't Dehydrate

The key to Gulf Oil Corp.'s high-gel cement that doesn't dehydrate as it passes through porous formations is the use of larger-than-usual amounts of bentonite, and special additives.

Gulf says its new cement contains a mixture of common cement, 20% bentonite or gel, and 3% sodium chloride, with 132% water. (Cement mixtures are based on the weight of dry cement. Thus, 100 lb. of dry cement is equal to 132 lb. of wet cement.)

"We have low water loss properties" a company spokesman says, "because of the dispersed characteristics of the slurry and high bentonite content."

The low water loss properties prevent the cement from dehydrating as it passes through extremely porous formations, he says.

In addition, Gulf believes its new high-gel cement will allow more uniform cementing jobs between the casing and the formation.

The company, which first started working on controlling water loss ten years ago, says its cement is the first to contain more than 10% bentonite and still hold its strength.

"We felt that water loss additives were not the entire answer," says a spokesman. "These additives are both rare and expensive, and their effective use doubles the cost of the operation."

Then came the development of conventional gel cement. It contained common cement, 10% gel, water, and calcium. The principal drawback here, says Gulf, was the limitation on the amount of gel that could be added.

Gulf feels it has found a way to increase the gel in the cement and at the same time increase the strength of the composition.

"We have found a way to increase the gel to 16% to 20% by using a critical concentrate of sodium chloride or calcium chloride in the composition," the company says.

"This not only results in greater strength, but also vastly improves other properties, such as the pumping and viscosity characteristics.

"This, of course, means that we cut considerably the time required to mix the cement.

"Along the same line, the mixture accelerates the strength development of the cement and stabilizes the pumping time."

The company says its cement has a slurry density that varies between 12.3-lb. and 12.6 lb. per gal.

In addition, the high-gel cement will develop 500 psi. "compressive strength within 24 hours, thus providing the necessary safety factors."

Use of this cement in two West Texas wells recently resulted in 50% lower costs for cementing.

Gulf says that its cement is the least expensive of cement slurries to be found, and adds that high-gel cement normally will cost 15% less than present conventional gel cements, and 30% less than regular neat cement.

There's good material and plenty of it in these packing elements. (Note the big holes—big because the packer bores are big and unrestricted.)

TWO BASIC MODELS

Model J (Product 756-J) is long-string set. Model K (Product 756-K) is short-string set. Both come with or without hold-down buttons (double or single grip). The picture shows double-grip Model J.

How to make a dual-string hookup that works

Required: a dual packer that works

NOTHING DEFEATS THE ECONOMICS of a dual completion like a dual packer that leaks. You must have a positive and dependable packoff.

It's fundamental—to make a dual string hookup work, you must have a dual packer that works, one that packs off and holds. That, many operators state plainly, is the reason they are using the new Baker duals.

WHAT MAKES THE PACKOFF SO POSITIVE? The reasons are designed into the simple and rugged 3-element packoff mechanism you see in the pictures.

There's been a lot of favorable comment on this design. It holds so well it doesn't need the non-retractable metallic back-up rings that so often stick to the casing and defeat retrievability. The 3-element concept came out of a tough proving ground. It was adapted from Baker's high-performance retrievable squeeze packers, proved in thousands of high pressure downhole operations.

BUT WHEN YOU'RE MAKING THE HOOKUP, you discover that while a positive packoff is essential, it isn't everything. You must have flexibility, too.

When you want to space out, to test packers before displacement—that's when you discover the importance of a packer that offers repeat setting.

A BAKER SNAP-SET DUAL is one packer that gives you both pressure holding power and flexibility. You set and pack off by setting down minimum weight—and the packer holds. You release by picking up.

It's just that simple. You don't pressure, you don't rotate, you don't drop balls—and you don't come out of the hole to re-cock.

You set and unset as many times as you need to. And when your hookup is made, you've got one that works.

BAKER SNAP-SET DUAL PACKERS

BAKER OIL TOOLS, INC.

HOUSTON LOS ANGELES NEW YORK

49 PAGES OF FACTS

With big pictures and few words, a new brochure tells the interesting engineering facts about Baker's new Snap-Set Dual Packers. Get it from Baker representatives, or write to Baker Oil Tools, Inc., P.O. Box 2274, Terminal Annex, Los Angeles 54, California.

"It's a good feeling to know we have Edward Mudwonder Valves on our #10 rig"

Johnny Sharon, Drilling Superintendent for the Power Rig Drilling Company of Lafayette, Louisiana, has had a lot of experience with Edward Mudwonder valves. Recently we talked to Johnny at Land Rig #10.

"As far as we know," Johnny said, "our #10 rig is the most powerful rig in Louisiana, and it's as versatile as a rig can be. We can drill competitively at anything from 12,000 to 25,000 feet because the rig is designed for versatility, and the equipment on it is selected for rugged, dependable duty. Mudwonder valves give us just that kind of service.

"We have replacement gates and seat inserts on hand, but it's a good feeling to know that we probably won't have to use them. My experience with Mudwonder valves on this new rig bears out the experience I've had on other rigs. That's why #10 is an all-Mudwonder rig, from mud tanks through stand pipe."

This confidence in Edward Mudwonder valves is found wherever you go in the drilling fields. Mudwonder valves are built in 2", 3" and 4" sizes, with screwed or flanged ends, for 2000 psi WP (4000 psi test) and 3000 psi WP (6000 psi test) service and in 2" size for 5000 psi WP (10,000 psi test) service. See your favorite oil field supply store, or write Edward Valves, Inc., East Chicago, Indiana. Subsidiary of Rockwell Manufacturing Company. 4018

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another fine product by
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Thermal Recovery Research Starts

Some answers concerning the use of in-situ combustion as a method of secondary oil recovery may result from a laboratory research program now under way at the University of Oklahoma.

Conducted by Robert H. Perry, associate professor of chemical engineering, the project is aimed at both theoretical and applied research on heat transfer with flowing fluids in porous media.

Says Perry: "At least four basic mechanisms are involved when heat is transferred in a media such as an oil-bearing strata. But no theory exists to provide a basis for predicting the relative effects of the various transfer mechanisms."

The project is being backed by a $45,700 grant from the National Science Foundation.

The work will be divided into two phases—a theoretical approach making use of OU's computer facilities, and laboratory work to verify the theoretical findings.

Differential equations involving processes of heat transfer by conduction, convection, or physical movement of the fluid will be developed, then solved by electronic computers. The results will be evaluated under carefully controlled conditions.

Initial mathematical tasks involving initial findings already are being solved by an IBM 650 computer on the university's main campus. More advanced theoretical calculations will be worked out on an ultrahigh-speed computer when installation is completed this fall.

Experimental studies, to begin soon, will involve use of a cylindrical tube in which a reservoir core sample will be mounted. A heated fluid will be injected into the core and the resulting temperature profile measured.

The experimental results will be combined with the theory to develop a method of predicting heat transfer rates in porous rocks.

A research program on the kinetics of in-situ combustion also has been started. This consists of a theoretical and experimental investigation of the combustion of coke which is deposited on the rock and consumed as fuel in the reservoir.

Secondary Recovery Projects Approved

The Texas Railroad Commission has approved secondary recovery projects calculated to boost ultimate recovery by more than 16-million bbl.

The requests approved last week included waterflooding and pressure maintenance.

Largest of the projects approved is a pressure maintenance program aimed at raising ultimate oil recovery by 5.7-million bbl.

The project is for the Paluxy (Chisum sand) reservoir underlying Skelly Oil's W. C. Chisum lease in Sand Flat field, Smith County.

The 1,500-acre producing area has 25 wells.

The biggest waterflood operation approved by the commission is estimated to result in additional recovery of 5.5-million bbl. of oil.

Three Bee Investment will conduct the waterflood in the Bryson Sand reservoir under the Bryson Unit in East Bryson field, Jack County.

The reservoir, which is at a depth of 2,900 ft., so far has yielded 3,874,000 bbl. of oil.

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Gardner-Denver is keeping pace with oil industry progress in the development of equipment today for the challenge of tomorrow. Ask your Gardner-Denver petroleum industry specialist about these great new products for deepest drilling.

EQUIPMENT TODAY FOR THE CHALLENGE OF TOMORROW

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In Los Angeles . . .

Townlot Drilling Keeps Spreading

The dream of a backyard oil well is coming true for more and more residents of Los Angeles, Calif., where townlot drilling has produced some of the brightest discoveries in the oil-rich Los Angeles basin.

In 1958, such work accounted for three out of five pool discoveries, including two by Signal Oil & Gas and Richfield Oil Corp. (L.A.) at Cheviot Hills and one by Universal Consolidated Oil Co. in Beverly Hills pool.

Last year, a townlot campaign produced the only commercial pool of the year in the Los Angeles Basin—a discovery by Continental Oil Co. at Culver City.

So far this year, townlot drilling has accounted for one pool discovery.

Latest success is the discovery of a pool that officials of the companies involved say "could prove of major importance."

The pool, called Las Cienegas (the marshes), is in the La Brea-Crenshaw district of Los Angeles.

The discovery, Union Oil Co., of California No. 3 Union-Signal-Pacific Electric, flowed 37-gravity oil at a 1,200-b/d rate on a 10½-hour production test through 26/64-in. choke.

The producing interval in the well, which is shut-in awaiting production facilities, is between 5,000 ft. and 5,300 ft.

Two additional wells that electric logs indicate will be productive are awaiting preliminary tests.

The discovery was made on a 7,000-acre lease block in which Union, the operator, has a 60% interest, and Signal, a 40% interest.

Leases were signed with nearly 25,000 home owners in the area before exploratory drilling was started.

Drilling in Greater Los Angeles provides one of the most active sources of drilling in California today, with six rigs active, at last report, in exploratory work.

In the Brentwood area, Mobil Oil Co. was drilling below 9,026 ft. at No. 1 Brentwood, section 32-1s-15w, a projected 15,000-ft. test on property of the Brentwood Country Club.

In the Los Cienegas sector, Union No. 4 Union-Signal-Pacific Electric, an outpost to the recent pool discovery, was being drilled below 4,756 ft.

In the Los Angeles City area, slightly more than 1 mi. from the heart of the downtown shopping district, Standard Oil of California No. 57-1 Southern Pacific, section 34-1s-13w, was being drilled below 6,300 ft.

This test, which is programmed to 10,500 ft., is on a 3,500-acre block that necessitated lease signing with 16,000 property owners.

In the Monterey Park area, Texaco Inc. No. 1 Heller, section 28-1s-12w, was being drilled below 2,279 ft. in a projected test to 11,000 ft.

In the Rosemead area, Humble division of Humble Oil & Refining Co. No. 1 Rosemead Oil Unit 1, section 19-1s-11w, was being drilled below 7,028 ft.

In the Salt Lake area, Buttram Petroleum Corp. No. 2 Gilmore, section 21-1s-14w, was being redrilled after reaching a depth of 3,335 ft. The test is a follow-up to the operator's No. 1 Gilmore, which is shut-in after being completed for undisclosed production from a redrilled depth of 3,150 ft.

In addition, three rigs are engaged in development drilling.

One is working for Universal Consolidated Oil in the Beverly Hills pool, and two are working for Signal at Cheviot Hills.

Townlot owners get a 1/6th royalty from Union Oil Co. of California.

Primary term of the lease is ten years and the bonus paid is $10 per lot, which pays rental for two years.

This comes to about $60 per acre for the two-year period. Union pays rental at the rate of $60 per acre for the balance of the primary term.

The companies operate under strict municipal regulations in developing Los Angeles oil. And they go to extremes to keep rigs and fields nuisance-proof.

An example is Cheviot Hills pool where Signal, as operator for itself and Richfield, is developing the Rancho Golf Course and Hillcrest Country Club discoveries made in 1958.

The company has completed 12 wells for about 4,200 b/d of oil.

Drilling rig derricks are heavily quilted and painted nine different colors to blend with the surroundings.

The colors range from sky-blue at the top to foliage-green at the bottom.

That's how Signal "adapts" the two electric rigs on its leases to the surroundings.

Production equipment is buried in concrete cellars, and all production is shipped by underground pipelines. A vapor recovery system prevents emission of any fumes in the area.

An LACT system provides the safety factor of shutting in wells in the event of failure of any of the component equipment. And it also reduces operating costs by removing the need for gauges and extensive storage tanks.

SOUNDPROOF and nuisance-proof drilling operation is conducted by Signal Oil & Gas with a quilted and painted derrick at the Hillcrest Country Club, Los Angeles.

"Petrochemicals? You Bet!"

First City National Bank was among the first banks to recognize the almost unlimited future of the petrochemical industry. Financing all phases of its operations has become an important function of the Bank's Oil and Gas Department. If petrochemicals are in your planning, talk over your plans with men who *know* the business – the men of the First City National Oil Department. Come in to see us.

FIRST CITY
NATIONAL BANK OF HOUSTON

MEMBER FEDERAL DEPOSIT INSURANCE CORPORATION

What's New / IN EXPLORATION, DRILLING, PRODUCTION

Northeast Alaska Gets Magnetometer Survey

An airborne magnetometer survey of 21,000 sq. mi. in northeastern Alaska is scheduled to be completed this month.

The survey, which is being conducted by Fairchild Aerial Surveys, Inc., in the Ft. Yukon area, for five U.S. oil companies, is of a reconnaissance nature designed to give a quick over-all picture of the geologic features of the area.

•

Two Test Holes Drilled For Atomic Blast Project

At least two of the test holes for observation in determining how much electric power can be generated by an atomic blast have been drilled and others either are drilling or projected.

Yates Drilling Co., Artesia, N. Mex., has drilled two 1,200-ft. holes at the project site near Carlsbad, N. Mex.

Water will be pumped down one of the holes and steam extracted from the other in order to power a generator.

Everett D. Burgett Drilling Co., Carlsbad, has contracted to drill two more holes.

Project "Gnome," as the study is called, is a joint effort of the Atomic Energy Commission and the U.S. Geological Survey.

•

Kansas Drilling Declines

Kansas drilling activity during July was down 57 tests from June and 106 tests from the 332 tests reported for July, 1959.

Of the 226 tests completed last month, 66 were classified as wildcats and 160 as development tests. Eight of the wildcats were completed for oil, five for gas, and 62 as dry holes.

Sumner County led in activity for July with 19 completions, followed by Kingman and Marion Counties with 17 each.

Marion County leads in activity for the first half of this year with 145 completions, followed by Butler County with 129.

Leasing News

Pan American Petroleum Corp. and Standard Oil of California were high bidders in two recent drilling reservation sales in Alberta.

Pan Am paid $74,701 for 9,947 acres in the southern part of the province. Canadian Oil Companies paid $32,185 for 6,285 acres in central Alberta and then teamed with Amurex Oil and Ashland Oil & Refining to pay $31,232 for 5,120 acres in southern Alberta.

Standard of California on the previous day paid $20,444 for 71,040 acres in the Swan Hills area.

Bidders at Wyoming's Wind River Indian lands lease sale paid $157,570 in bonuses for 2,839 acres.

Atlantic Refining Co. was high bidder, offering $163 per acre on two tracts just east of Riverton pool. The company also was high bidder on four other tracts in this area with bids ranging from $11 to $102 per acre.

Amerada Petroleum had the high bid of $7.81 per acre on four tracts on the Sage Creek anticline.

Skelly Oil and Sohio Petroleum had high bids ranging from $11 to $51 per acre on four and five tracts respectively in an undrilled township west of Steamboat Butte.

Montana's state lease sale drew bonus bids amounting to $21,178 for the 17,578 acres leased.

Humble division of Humble Oil & Refining Co. paid the sale's high bonus of $4.75 per acre for one tract in Wibaux County.

The only other bids higher than $1 per acre was Ambassador Oil's bid of $1.75 per acre for a tract in Carter County and Bruce McNamer's bid of $3.25 per acre for a tract in Toole County.

Bonus bids on 11,390 acres of western Nebraska state lands totaled $41,510.

Leaders in the bidding were Petroleum Inc., which bid $25 per acre for a 40-acre tract section 16-18n-56w, Banner County, and British-American Oil Producing Co., which paid $11.75 per acre for all of section 36-16n-57w, Kimball County.

•

Some 15% of the oil produced in Kansas last year—17.9-million bbl.—was by secondary recovery.

The Kansas State Geological Survey said that 511 of the 601 active secondary recovery projects last year were in eastern Kansas.

Secondary recovery, however, is spreading to many producing areas in central and west central Kansas, according to the survey report.

Butler and Greenwood Counties led the state in secondary recovery last year. Each county had more than 80 active projects.

•

The first commercial seismic survey in Atlantic seaboard waters is scheduled to begin in a few days off the Georgia coast.

Offshore Exploration Group, Inc., will conduct the survey for Pure Oil Co. The two-months-long survey is expected to be conducted 50 mi. out to the continental shelf.

•

An operator credits waterflooding in the Wilmington, Calif. "subsidence

Heated Waterflood For Red Wash Pool

Standard Oil Co. of California proposes a preheated waterflood project for Red Wash pool, Uintah County, Utah.

The company will ask the Utah Conservation Commission for a hearing on a pilot unit involving conversion of an abandoned well in the west end of the pool.

If the pilot project is successful, the company will establish a peripheral flood in the west section of the pool. Tentative plans call for extending the flood to the east sector (and main producing area) by 1961. Red Wash production is about 1,500 b/d of oil.

To get maximum efficiency, the flood water will be heated to 125F, bottomhole temperature at 5,200 ft. for the high pour-point oil.

bowl" with increasing production by 500 b/d since Jan. 1.

Producing Properties, Inc., reports the increase on two leases underlying downtown Long Beach.

In addition to boosting production, the waterflood is helping restore underground pressures and halt subsidence.

•

The Interior Department is planning to offer for leasing 7,840 acres of land at Barksdale Air Force Base, near Shreveport, La.

The department, which last week was given jurisdiction over the land, will advertise for bids because the Air Force acreage is subject to drainage by wells on adjacent private property. The Air Force will retain primary jurisdiction over the lands for Air Force purposes.

•

Directors of Westpan Hydrocarbon Co. have authorized sale of the company's liquid hydrocarbon assets in the West Panhandle area to Amarillo Oil Co. for $2.9-million.

The sale is subject to stockholder approval of a plan for complete liquidation. Westpan's oil and gas properties and other assets are not included in this sale.

•

Drilling Highlights

South Louisiana—An-Son Petroleum et al No. 1 Celotex, section 12-14s-23e, Jefferson Parish, was completed for 324 b/d of 32-gravity oil through 12/64-in. choke and perforations at 9,196-202 ft. The discovery is 4 mi. southeast of Westwedge pool.

Wyoming—Max Pray No. 1 Government-Akridge, section 19-15n-112w, Uinta County, flowed gas at rates of 10-million to 20-million cf/d on a drillstem test at 12,878-964 ft. The prospect is 5 mi. south of Dakota gas production at Church Buttes field.

East Texas—Fairway Operating Co. No. 1 W. B. Wofford, Joseph Ferguson survey, Anderson County, was completed for 420 b/d of 47-gravity oil through 12/64-in. choke and perforations at 9,950-89 ft. in the James lime (lower Cretaceous). The wildcat is 2 mi. southwest of the one-well (James lime) Frankston pool.

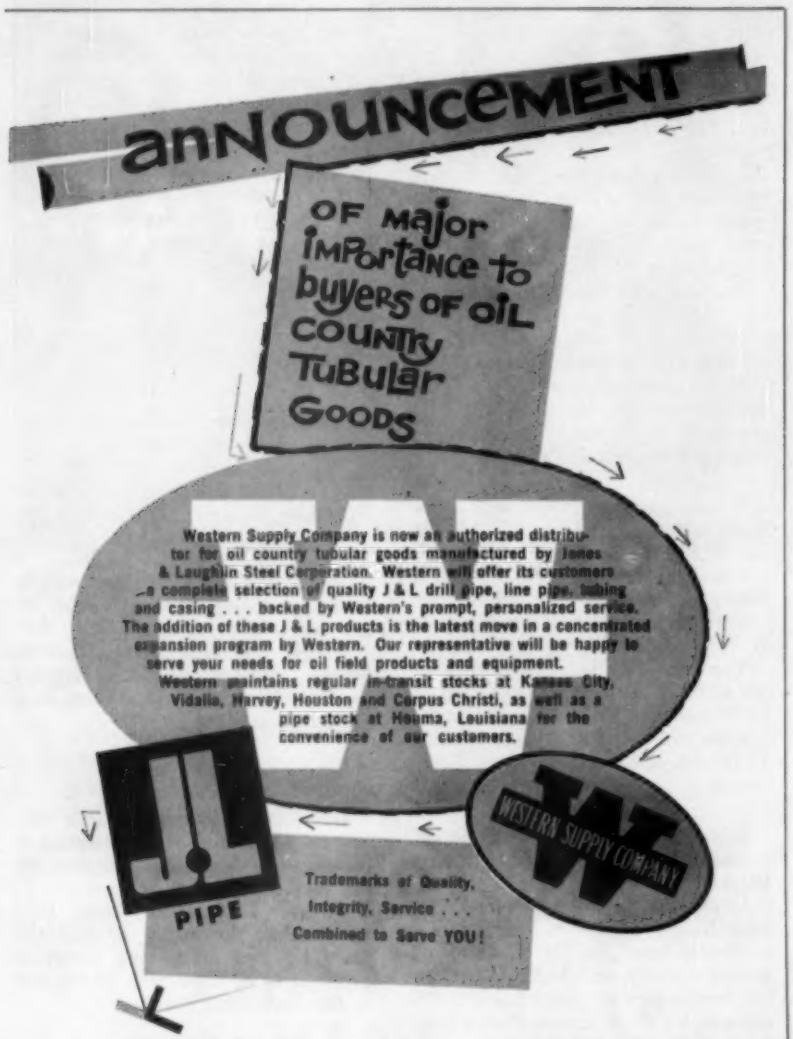
Texas Panhandle—Shamrock Oil & Gas Corp. No. 1 W. L. Herndon, Jr., et al, section 490, block 43, H&TC survey, Ochiltree County, was completed for 8.6-million cf/d of gas open flow through perforations at 9,576-90 ft. in the lower Morrow. The discovery is located approximately 2½ mi. northwest of gas production in the West Turner area.

Montana—H. L. Hunt Jr.-Trust Estate No. 1 NP, section 25-15n-55e, Dawson County, recovered 1,974 ft. of oil and 3,126 ft. of salt water on 5-hour drillstem test at 9,838-73 ft. in the Red River. The wildcat, which is on the east flank of the Cedar Creek anticline, is 6 mi. east of Red River production at Glendive pool.

North Texas—Midwest Oil Corp. No. 1 Clem Crim, E. Donaldson survey, Montague County, was completed for 112 b/d of 41-gravity crude through 24/64-in. choke and perforations at 5,829-34 ft. in the Bend conglomerate. The wildcat is 3 mi. south of West Aries pool.

Nebraska—Edward M. Davis No. 1 Peterson, section 6-19n-56w, Banner County, was completed on the pump for 125 b/d through perforations at 6,236-39 ft. in the D sand. The well is 1½ mi. north of Peterson pool, which produces from the J sand.

Utah—Petan Co. No. 3 Stone Cabin Unit, section 3-12s-14e, Carbon County, was completed for 1.5-million cf/d of gas through perforations at 3,949-67 ft. and 4,260-74 ft. in the Wasatch. The discovery is 2½ mi. northwest of Great Lakes Natural Gas No. 1 Unit, a shut-in gas well.


announcement
of major importance to buyers of oil country tubular goods
Western Supply Company is now an authorized distributor for oil country tubular goods manufactured by Jones & Laughlin Steel Corporation. Western will offer its customers a complete selection of quality J & L drill pipe, line pipe, tubing and casing . . . backed by Western's prompt, personalized service. The addition of these J & L products is the latest move in a concentrated expansion program by Western. Our representative will be happy to serve your needs for oil field products and equipment. Western maintains regular in-transit stocks at Kansas City, Vidalia, Harvey, Houston and Corpus Christi, as well as a pipe stock at Houma, Louisiana for the convenience of our customers.
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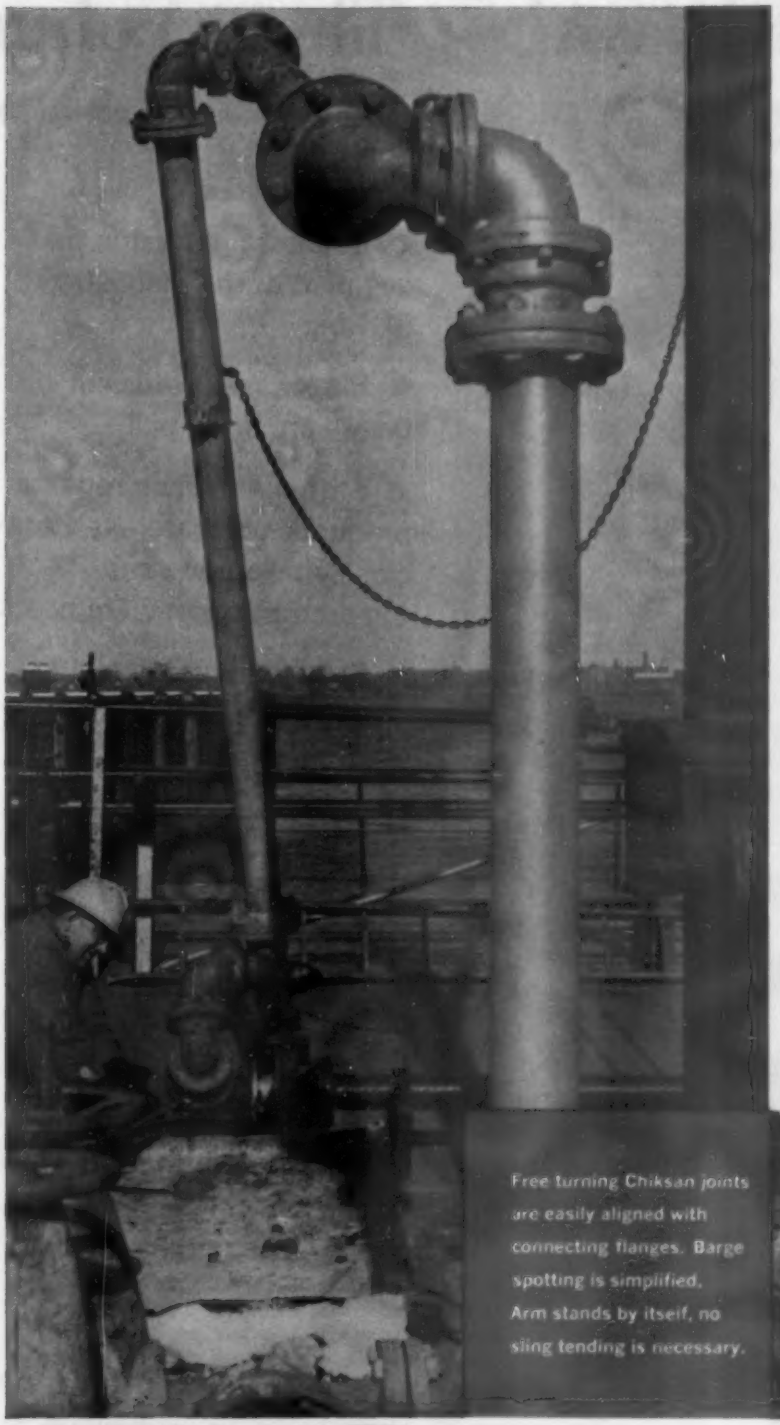
Speaking of handling corrosives—



Free turning Chiksan joints are easily aligned with connecting flanges. Barge spotting is simplified. Arm stands by itself, no sling tending is necessary.

THIS CHIKSAN LOADING ARM IS HANDLING 41 MILLION POUNDS OF SULFURIC EACH MONTH WITHOUT A LEAK

At best, handling corrosive sulfuric is a problem. And when the situation is compounded by need for a flexible line, the problem can become acute. This was the situation presented to Chiksan by a large chemical plant in the east. A flexible steel loading arm, incorporating new DS Series Chiksan swivel joints provided the solution. Utilizing DuPont's Viton A packings*, this loading arm is used to service barges bringing sulfuric to a processing plant.

As to results, the customer writes: "At the time the photographs were taken, the installation had been in service for six months without acid leaks and the only maintenance required was the normal lubrication of the Chiksan joints. An average of 41,000,000 gross pounds per month of sulfuric acid, 54° Baume, 60° Baume and Oleum was pumped through the installation during the six-month period."

Chiksan's DS Series swivel joints, developed especially for chemical, steam and hot gas service, are but one of the many swivel joints you can apply to solve your flexible line problems. There's a close-by Chiksan Field Representative ready to analyze your requirements and make recommendations. Write Chiksan today for his name and copy of our catalog.

*Reg. T. M. DuPont

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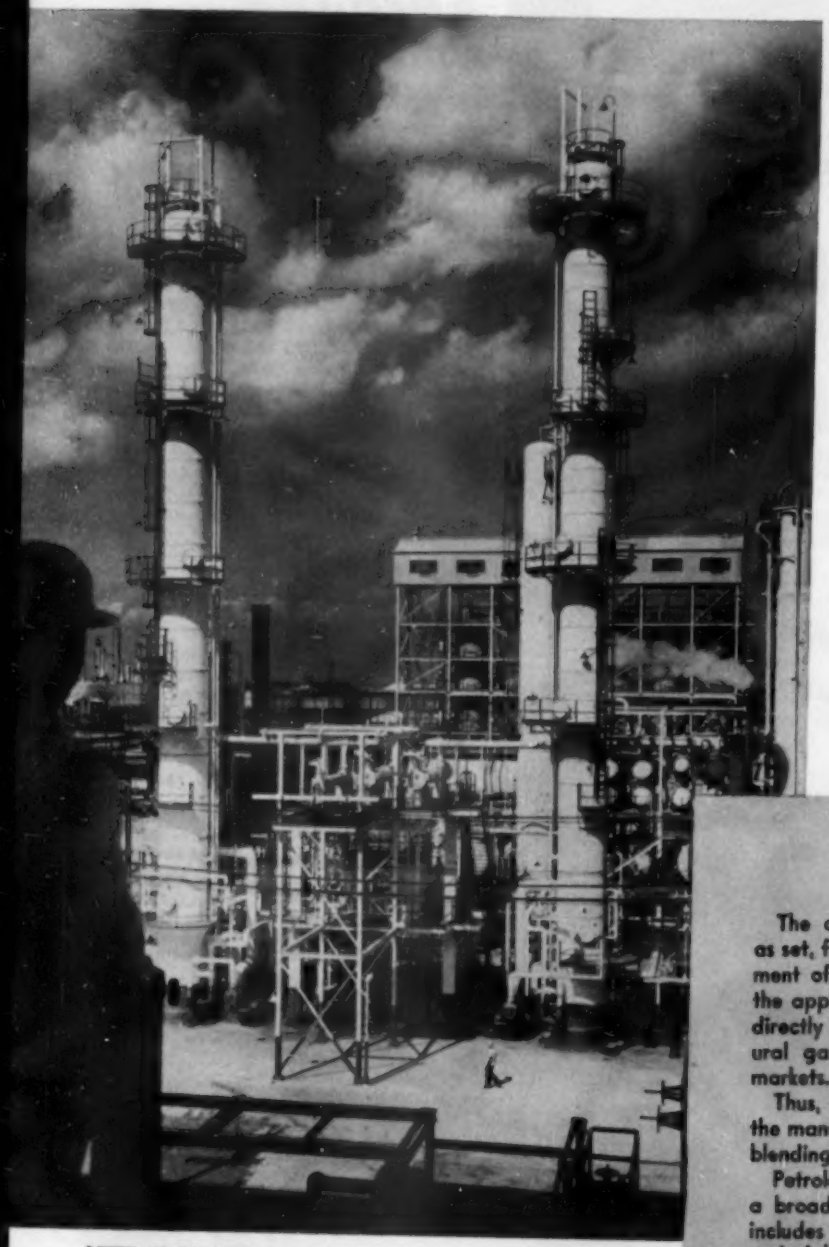
PETROCHEMICALS: Their Volume



NEW PROPYLENE POLYMER UNIT at Gulf's Port Arthur refinery typifies oil industry's new interest in petrochemicals.

The market for petrochemicals

AS A RESULT . . .

- Refiners' interest in that segment of their industry is rising
- Bigger, more efficient plants are being built
- Stiff competition requires production of materials more closely tailored to customers' specific requirements
- But the resulting multiplication of closely similar versions is proving to be a handicap to producers

What Is a Petrochemical?

The conventional definition of a petrochemical as set, for example, by the market research department of Union Carbide Chemicals Corp., restricts the application of the term to compounds that are directly isolated or derived from petroleum or natural gas, and which are intended for chemical markets.

Thus, benzene is a petrochemical when used for the manufacture of styrene, but not when used as a blending compound for gasoline.

Petroleum Week, in this Special Report, makes a broader use of the term "petrochemical," and includes under that name all products made with materials having their origin in petroleum or natural gas, all the way through their ultimate applications.

Any variation in the market for these products has a direct repercussion upon the petroleum and gas industry from which their raw materials are derived.

Grows, Their Applications Multiply

is growing steadily, both in volume and in the variety of the demand

Petrochemical processors are continuing to build new production facilities in anticipation of a steady increase in demand at least through 1965.

Every division of the organic chemicals market, of which petrochemicals constitute at least 80%, showed increased sales in 1959 (table, below). On the basis of manufacturers' estimates, such increases should carry on well into the '60s, at least. During the next couple of years, the average rate of increase should approximate 5% to 7% per year.

A list of the companies that have either expanded their facilities or built new plants—or are in the process of doing so—reads like the roster of the chemical industry in the U.S.

The plastics industry is perhaps the most typical of "exploding" petrochemical production.

A. F. Sward, manager of the market research department of Union Carbide Plastics Co., predicts that plastics production of 5.6-billion lb. in 1959 will rise to 8.1-billion lb. by 1965.

The plastics industry has two main divisions: the packaging film field, where new versions with improved properties are being introduced on the market every few months, and the molding and extruding field.

Many plants and plant expansions are currently under way for production of both polyethylene and polypropylene. And each of these ventures amounts to many millions of pounds of capacity.

The production of propylene is also being boosted, for its use as raw material for glycerine as well as for polypropylene.

Facilities are also being expanded rapidly for the making of elastomers.

In 1959, the production of all types of synthetic rubber in the U.S. totaled 1,236,000 long tons, an increase of nearly 30% over the 1958 production.

Additional capacity is being installed for the making of all types of rubbers and latexes, including cis- and trans-polybutadiene; polyisoprene, the "synthetic natural rubber"; butyl rubber and latex; conventional SB-R rubbers, about one-half of which are "oil-extended"; neoprene; and isotactic polybutene.

To such a list should be added the various "foams," such as the polyurethanes, and the polyethylene and polyester foams made by Dow Chemical Co.

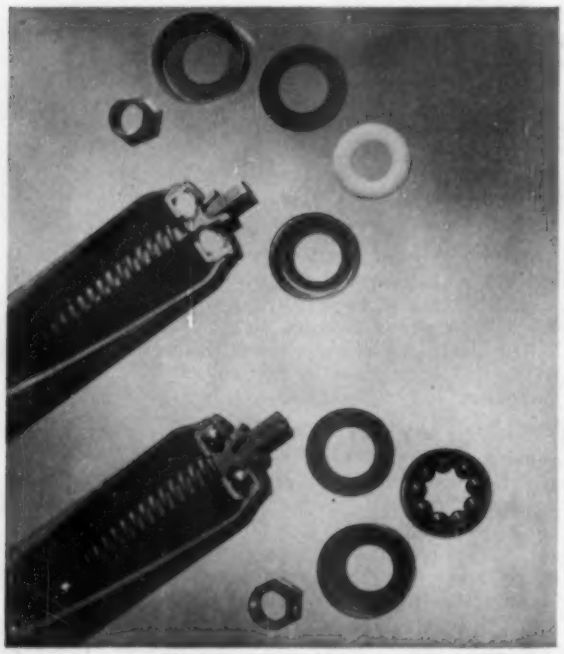
Closely related to elastomer production is that of

continued ▸

U.S. Production of Chemicals from Crude Oil and Natural Gas

	1958	1959	% Change
	(Thousands of pounds)		
Aliphatic Hydrocarbons*	**15,618,565**	**17,527,137**	**+12.2%**
Ethane and Ethylene	4,795,322	5,644,902	+17.5
Propane and Propylene	5,035,744	5,488,679	+ 9.0
Butane, Butadiene, Butylene, and other C_4	4,294,619	4,698,230	+ 9.6
All others	1,492,880	1,695,326	+13.5
Aromatics and Naphthenes*	**5,284,934**	**6,749,827**	**+28.0**
Alkyl aromatics, Distillates and Solvents	1,271,785	1,629,831	+28.2
Benzene	1,041,659	1,530,423	+48.5
Cresylic Acid	38,078	37,888	— 0.5
Naphthenic Acids	18,961	19,843	+ 4.8
Toluene	1,501,337	1,817,095	+21.0
Xylenes	1,380,773	1,683,239	+22.0
All other aromatics and naphthenes	32,341	31,508	— 0.7
TOTAL*	**20,903,499**	**24,276,964**	**+16.2**
Carbon black**	1,702,270	2,055,467	+20.6
	(In tons)		
Recovered Sulfur**	619,594	650,763	+ 5.0
Anhydrous Ammonia***	3,878,778	4,509,317	+16.3

*U.S. Tariff Commission, preliminary 1959 data. **U.S. Bureau of Mines. ***U.S. Dept. of Commerce.



HOW PLASTIC REPLACES METAL: Rings of Delrin acetal resin (left) are used instead of steel balls for conveyor bearings, and quick-disconnect Delrin couplings (right) replace iron and aluminum on air-brake system of truck-trailer equipment.

styrene, a large portion of which is used in making synthetic rubber. The U.S. production of styrene may increase in 1960 by as much as 40%.

Maleic anhydride is another product whose output is headed sharply upward.

Capacity for this product is expected nearly to double this year. And the manufacture of fumaric acid—a sister chemical, used for similar purposes—shows the same sort of increase.

The combined output of these two products exceeded 65-million lb. in 1959, and should top 150-million lb. by 1965, manufacturers say.

This progress is due largely to the renewed popularity of the principal derivatives of these two products, the polyester resins, which are extensively used for the construction of boats and other large plastic objects. The production of these polyesters, which was 160-million lb. in 1959, is expected to reach 250-million lb. by 1965, according to James E. Sayre, director of market research of Allied Chemical Corp., and 1960 president of the Chemical Market Research Assn.

Other uses for maleic anhydride and fumaric acid are for the making of alkyd coatings and agricultural chemicals.

The steel strike of 1959—which closed down most of the country's coke ovens—showed the oil industry what a profitable market was available if it could increase its production of aromatics.

Consequently, new plants and plant expansions are under way for more benzene, more orthoxylene, and—for the first time in the oil industry—naphthalene. The latter is the principal ingredient used in making phthalic anhydride and phthalic esters, production of which is steadily increasing.

Big Volume From Industrial Uses

Plastics are increasingly invading the fields conventionally held by metals, wood, or glass.

Parts can now be produced cheaper, and frequently better, with one of the many plastics available, either alone or with glass-fiber reinforcement, than with the conventional materials. And the use of petrochemical products in the fields of construction, interior decoration, and automotive accessories has only begun (PW—Jun.3'60, p43).

continued ▸

"Both horizontal and vertical expansion, and plant investment, are becoming a necessity in the competitive petrochemical industry."

E. A. TERRAY
Vice-President, Market Research
Reichhold Chemicals, Inc.

WHEN YOU SELL SUN QUALITY PRODUCTS, SALES TO LOCAL FLEETS COME EASIER

An increasing share of the lubricant profits from the busy, bustling, local fleet market . . . taxis, laundries, dairies, and the like . . . can go to the independent oil marketer.

You can get all the help you need from Sun . . . to sell your story and set up your service facilities.

Let Sun help you build and maintain your reputation as a supplier of top-quality products. Sun has a line of petroleum products broad enough to satisfy every customer's needs.

You can sell a Sun product under your own brand name anywhere. In many areas you can get a distributorship for Sunoco fuel oils and other branded Sun products. In some areas distributorships for Blue Sunoco gasolines are still available.

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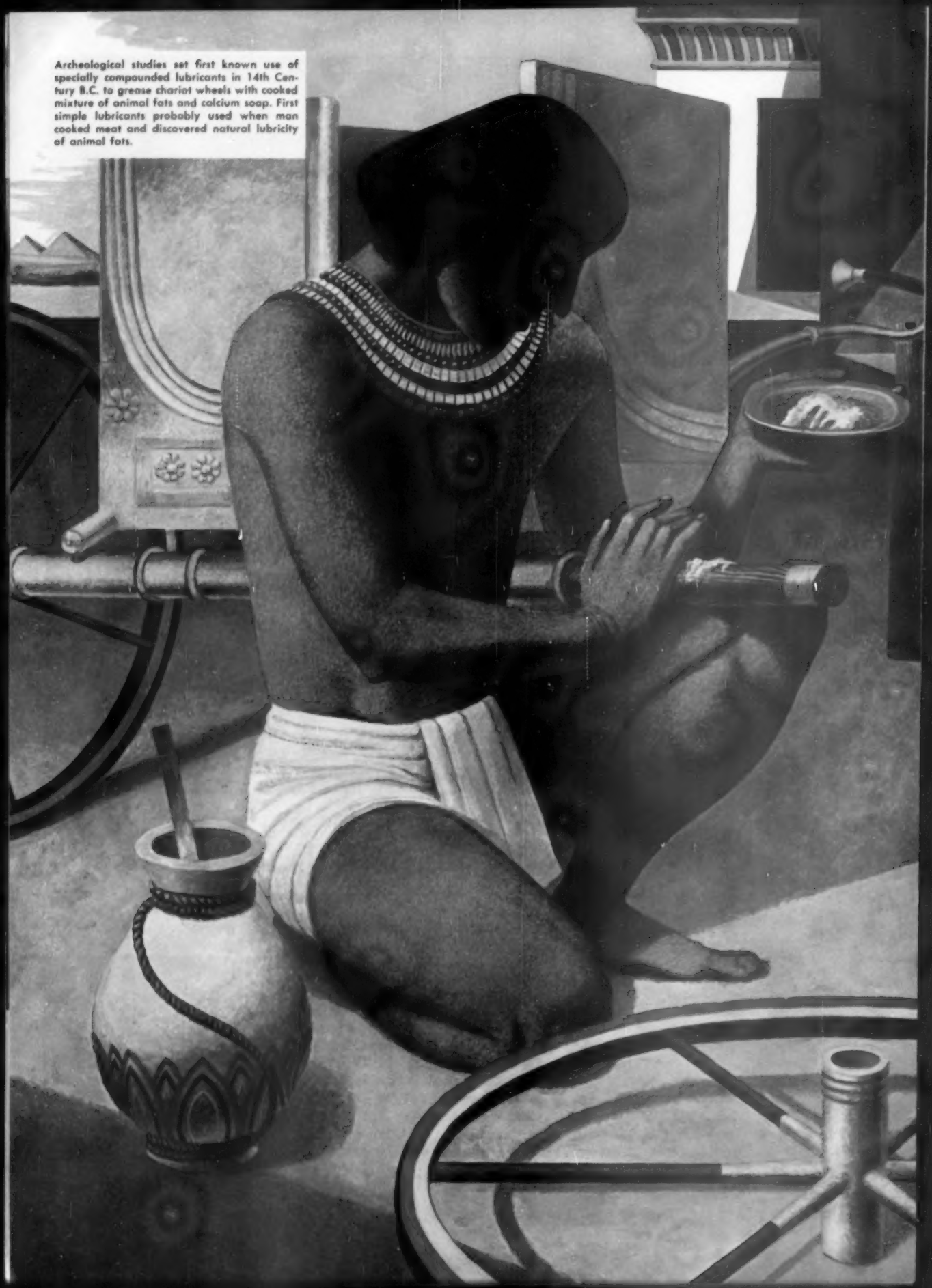
MAKERS OF FAMOUS CUSTOM-BLENDED BLUE SUNOCO GASOLINES



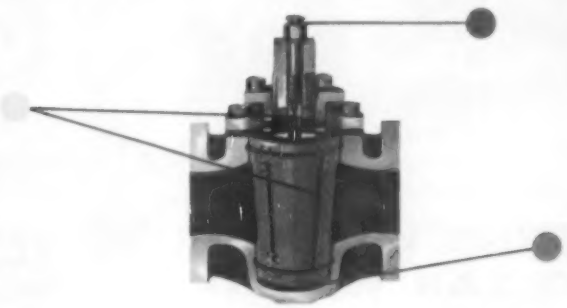
Archeological studies set first known use of specially compounded lubricants in 14th Century B.C. to grease chariot wheels with cooked mixture of animal fats and calcium soap. First simple lubricants probably used when man cooked meat and discovered natural lubricity of animal fats.

he greased the wheel of progress

. . . and his idea helped give you a better valve

One day about thirty centuries ago an ingenious charioteer silenced a squeaky chariot wheel with a handful of grease. To his surprise, the wheel not only ran quietly, but easier. Man had learned that lubrication makes things work better . . . and last longer.

Lubrication in Rockwell-Nordstrom lubricated plug valves does more than make them close easier and far outlast non-lubricated valves. *Pressurized* lubrication also hydraulically jacks the plug minutely from its seat, insuring easy operation and also maintaining a powerful seal against leakage around the plug . . . a seal that is instantly replaceable and can't be "worn out" like exposed metal-to-metal seats. For just a few of the reasons why you'll get better flow control at far lower cost with Rockwell-Nordstrom lubricated plug valves, examine the illustration below.



HOW LUBRICATION MAKES A BETTER VALVE

- Lubricant quickly, easily injected through Rockwell fitting.
- Lubricant travels through Sealdport® system to create powerful seals against leakage and prevent metal-to-metal wear between plug and body . . . note seats never exposed to the line.
- Lubricant hydraulically jacks plug minutely from seat for instant quarter-turn operation.

Rockwell-Nordstrom is the original and world's most complete line of lubricated plug valves. Available in sizes from ½" to 36" and pressures to 15,000 lb. For additional information, see your supplier or write: Rockwell Manufacturing Company, Pittsburgh 8, Pennsylvania. Canadian Valve Licensee: Peacock Brothers Limited. If you live outside the USA, write: Rockwell International S.A., Geneva, Switzerland.

Lubrication Makes The Difference

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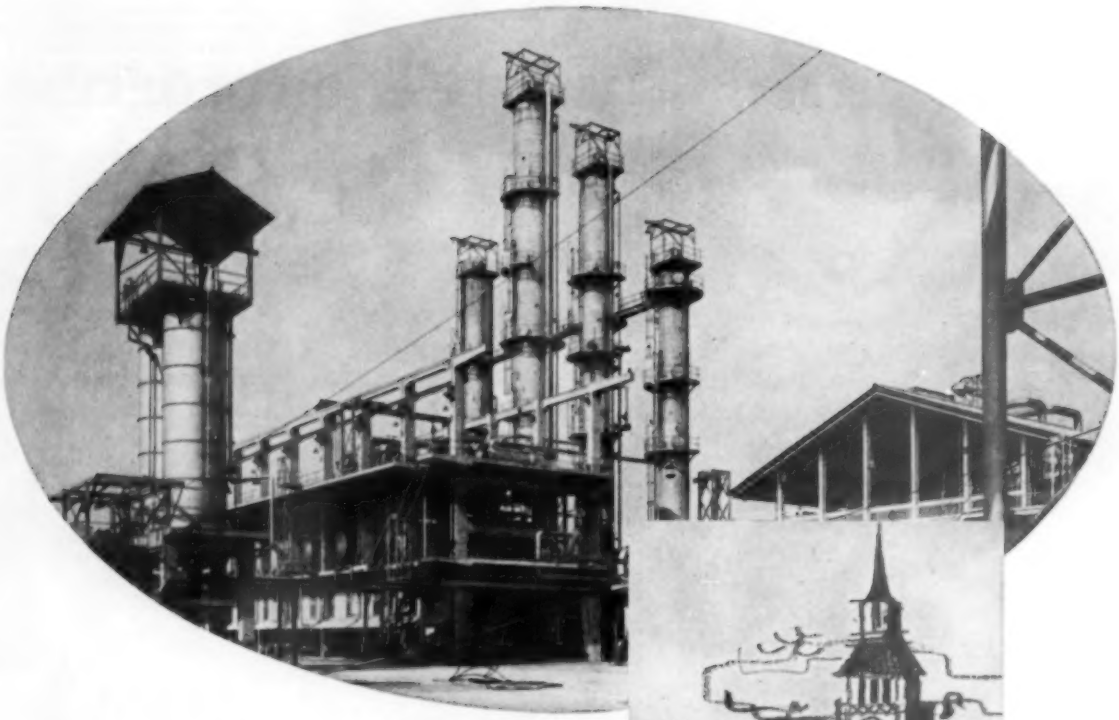

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They balance cost against performance . . . hold purchases strictly in line with your budget . . . check and recheck components large and small for materials, tolerances, stresses . . . provide a running account of purchases, a constantly current balance sheet, down to the last penny.

Procon builds plants that perform as intended . . . with materials, parts and components bought the way you'd buy them yourself, if you had the necessary time, facilities and personnel.

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WORLD-WIDE CONSTRUCTION FOR THE PETROLEUM, CHEMICAL AND PETROCHEMICAL INDUSTRIES

POLYETHYLENE-COATED PIPELINE is being installed at Warren, Pa. The coating is completely immune to corrosion, and does not soften or get brittle, says Republic Steel Corp.

Norman Copeland, assistant director of research of Du Pont's film dept. says: "The trend towards prefinishing of materials for the construction industry opens up tremendous opportunities for new films used as coatings on a variety of substrates. Of course, the development period for these techniques will be slower than for the packaging films. The products involved must have a much longer life, and they must be tested on a wider scale and over a longer range."

The sales volume of plastics is being boosted more by their industrial applications than by their uses in consumer goods.

"One of the features that contributes to the rapid growth of petrochemical consumption," Dr. Robert Leininger, of Battelle Memorial Institute, told PETROLEUM WEEK, "is that industrial uses, in general, grow faster than consumer uses. This accounts for volume markets."

Dr. Walter H. Rueggeberg, director of chemical research of Atlas Powder Co., is very optimistic about the important role that he sees in the future of petrochemicals. "The emphasis of petrochemical development," he says, "will be on structural material substitution, in electronics, for power production—for example in the fuel cell.

"The problem of satisfying the basic needs and wants of man, in a world of unprecedented population increase, will have enormous significance in the petrochemical field, and it's one that you don't handle overnight."

Meanwhile, the buying public has become petrochemical-conscious. Such technical terms as polyesters, vinyls, acrylics, epoxies, butyls, have been accepted in the everyday vocabulary. Without understanding precisely what these words mean, people today know that most of the plastics, fibers, and rubbers to which they refer are "synthetics," and that they have some connection with petroleum.

Refiners' Interest Increases

An increasingly significant contribution to the development of petrochemicals and to petrochemical plant construction is being made by the oil industry, directly or in joint ventures.

Refiners are making a new evaluation of the potential profit that they can earn from the production of chemicals. They realize that this is an attractive outlet through which they can dispose, at a profit, of some of the surplus production of the petroleum industry, small as this outlet may still be today. They have both the knowhow and the financial means to build the large, costly plants required for the upgrading of their hydrocarbons from "fuel value" to "chemical-intermediate value."

However, the percentage of hydrocarbons from oil or natural gas that is being converted to petrochemical intermediates is still relatively small. An estimate made by Arthur D. Little, Inc., shows that in 1959, the year of highest output to date, petrochemical consumption of products from natural gas and oil accounted for less than 4% of the total U.S. output of these hydrocarbons.

Most oil companies are highly optimistic over the future of their petrochemical operations.

"What do we, at Phillips, think about petrochemicals?" says T. L. Cubbage, vice-president and general manager of Phillips Petroleum Co. "The best answer is that we are expanding practically every operation we have in this field, and are contemplating entry into other petrochemical activities. Phillips' potential in this business is virtually unlimited. The increasing stream of new discoveries and developments of our research people indicate that this industry is just getting started."

"I am confident that production of petrochemicals will become a more and more important element of the petroleum industry as time goes on," says A. Lewis, Jr., manager of Gulf Oil Corp.'s petrochemicals department. "Also that the chemical industry, in a sense, relieved of much of the monumental burden of raw material supply problems, will benefit by being able to dedicate more of its efforts to de-

continued ▶

"Polymers are the big news these days. They have become the greatest outlet for petrochemicals, and will certainly become more so. Who can say what the next break-through will be, or when it will come?"

A. DONALD GREEN
Vice-President
Enjay Chemical Co.

Report from Tidewater...

How Cooper-Bessemer hydrogen boosters supply 800 psi 'round-the-clock

At Tidewater Oil Company's refinery south of Wilmington, Delaware, two Cooper-Bessemer FM-2 compressors play a vital part in the hydrogen treatment process by which the refinery upgrades a number of products and intermediate fractions. These hydrogen boosters operate 24 hours per day, boosting 690 cfm of hydrogen at 470 psi to a discharge of 800 psi. This hydrogen is delivered directly to the desulfurizers.

These Cooper-Bessemer compressors have performed well under this heavy-duty service. Maintenance costs and outage time have been low.

The customer is also pleased with the performance of three Cooper-Bessemer air compressors which supply utility air to the entire refinery on a 24-hour, 365-day per year basis.

Find out how Cooper-Bessemer products can help assure dependable compression and optimum economy for *your* processing. Call our nearest office for help in planning of your facilities.

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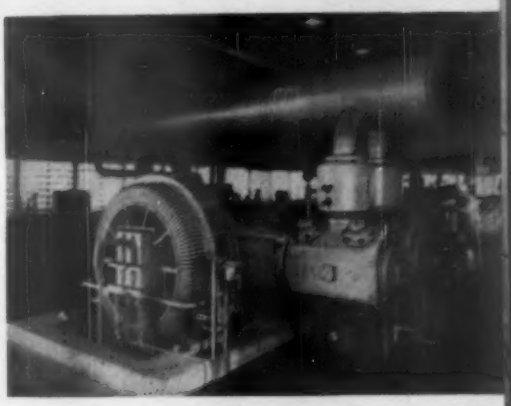
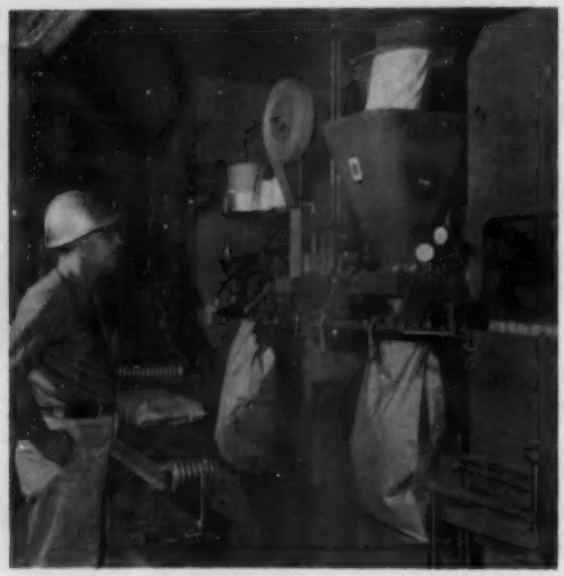
Cooper-Bessemer FM-2 Hydrogen Compressors at Tidewater Refinery. Rated 690 cfm, suction 470 psi, discharge 800 psi.



Three Cooper-Bessemer Air Compressors at Tidewater. They supply utility air at about 120 psi for processes throughout the refinery.



POLYPROPYLENE PELLETS are being packed, weighed, and shipped, at Humble's new polyolefin plant, Baytown, Tex.

velopment of new and better products at an even faster rate than today's amazing pace."

"We look for a slow but steady expansion of our petrochemical products line," says a spokesman for Sun Oil Co. "To a large extent, we expect that expansion to be toward large-volume, intermediate-use products."

Robert C. Sweeney, manager of market development of Sinclair Petrochemicals, Inc., points out that Sinclair's activities in the petrochemical market have been characterized by being selective. "We have attempted to participate in the chemical industry where we had something to offer," he says. "Besides Durene, one of our specialties, Sinclair has worked on the development of aromatics such as pseudocumene, mesitylene (trimethyl benzene), and others, which will probably be commercialized in the near future. We are now entering the field of styrene production, and we plan, within the next few years, to manufacture also conventional raw materials, such as ethylene."

Some observers see dangers in the trend to joint ventures between oil companies and chemical companies.

"Each company will presumably pursue an independent program of petrochemical research," Richard F. Messing, of Arthur D. Little, points out, "which may result in developments somewhat related to those carried on within the joint venture. This creates the dilemma of whether these results should be shared with the other partner, or whether they should be exploited independently.

Products not New, but Better

Actually, few new products have been put on the market in the past couple of years. But each new plant built in the petrochemical field accounts for some improvement either in a product or in its method of manufacture.

A PETROLEUM WEEK survey of 50 leading manufacturers of petrochemicals showed that most of the products put on the market in the past two years were new versions of current products. An increasing market for these products called for the construction of additional facilities, and each step upward in production capacity incorporated some feature resulting in the upgrading of the product. In fact, each plant being a rather complex unit, it's not usually possible to incorporate any substantial change in the manufacturing process unless a new unit is built.

Many of the new plants are taking entirely new routes to make known products better and more economically.

For example, the catalytic oxidation of butylene is being substituted for the oxidation of benzene for the manufacture of maleic anhydride. And the propane and propylene routes are used instead of the conventional ammonia-cyanide process for the making of acrylonitrile.

Consequently every producer, in announcing the construction or the initial operation of a new plant, can—and generally does—boast of an improved or more economical manufacturing process, enabling him to put out a more satisfactory product, or one that can be sold cheaper.

Technology, Key to Progress

The industry's ability to modify—and improve—its products has been based primarily on great advances in technology, made possible because of a better understanding of the use of requirements of the petrochemical intermediates produced.

Most petrochemicals available today have been on the market a relatively short time. But during that short period, their application to various uses has been intensely studied, and the requirements are gradually becoming better understood. To fit these requirements, certain modifications of the initial product have generally been necessary.

Among the technical developments that have made these improvements possible are:

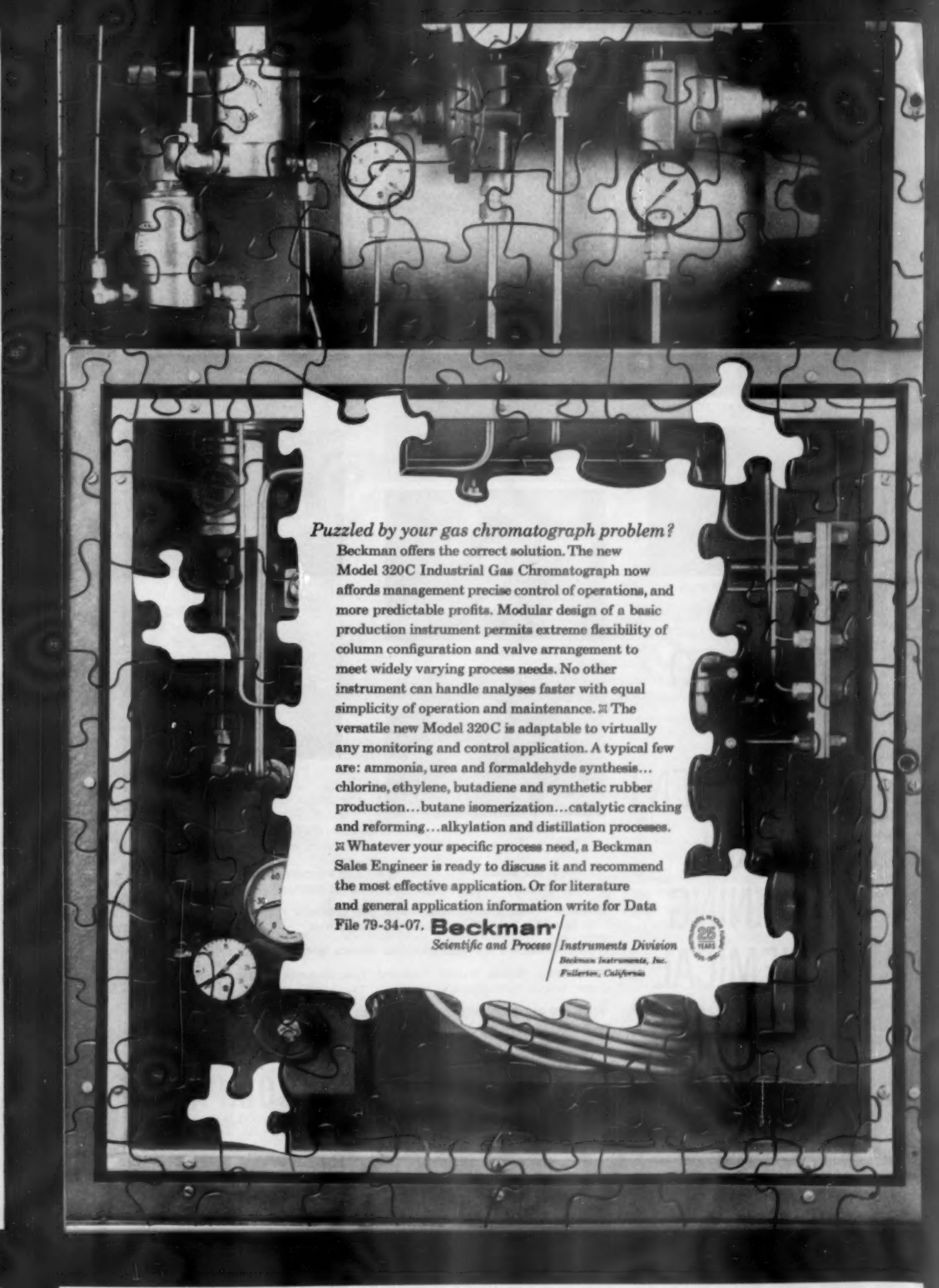
- Improved processing techniques and equipment.
- Greater purity of the raw materials used in the process.
- Better catalysts, and more uniform additives and reagents.
- More reliable instrumentation.

The improvement in equipment and machinery has resulted in an increase both in the size of the new facilities and in their efficiency.

continued ▸

"An indication of the importance we in Esso Research attach to the field of polymerization is the fact that a significant part of the approximately $16-million we are spending this year on petrochemical research is devoted to work in this area."

DR. C. L. FLEMING
Vice-President
Esso Research & Engineering Co.



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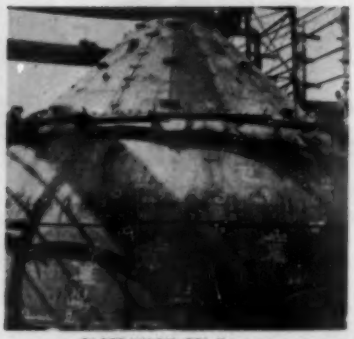
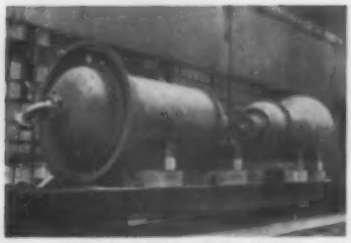


PLATE WORK, 55' dia. cone

GALVANIZING POT

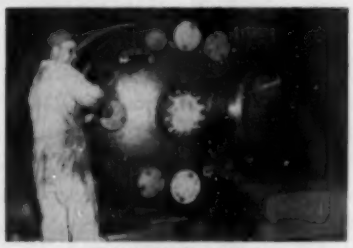
SPECIAL ALLOY STEEL DEFLECTORS

SPECIAL CHEMICAL VESSEL



SPECIAL STAINLESS VESSELS

TOWER, 8'6" dia. x 154' in length



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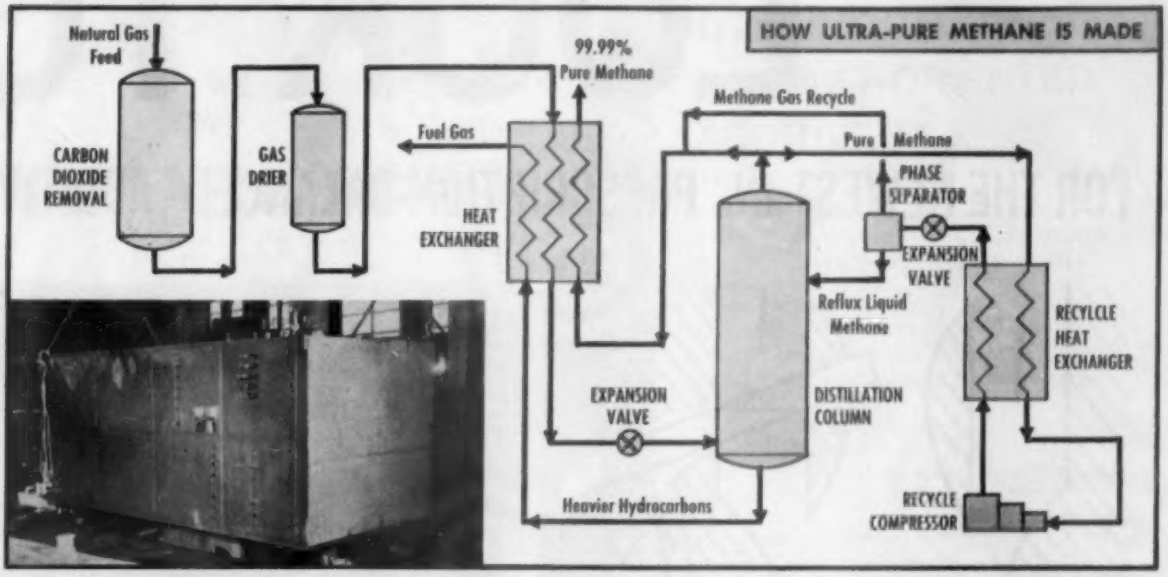


99.99% PURE METHANE is obtained by low-temperature purification. Diagram shows what goes on inside the "cold box" (inset).

"The role of the machinery and equipment manufacturers should not be underestimated," says Langdon P. Williams, of The Society of the Plastics Industry, Inc. "If they had not been so aggressive, so optimistic, and so far-thinking, the industry could never have gone so far so fast. It is the processor on one side, the machinery manufacturer on the other side, prodding each other for larger, better adapted, more efficient machines, that is one of the chief reasons responsible for our progress."

Greater purity of the raw materials can be obtained because of improved methods of fractionation, new methods of diffusion, and use of modern, low-temperature purification.

"The use of cryogenic [low-temperature] techniques in the petrochemical industry has undoubtedly resulted in improved yields and increased efficiency, as well as in the production of new materials," says Gordon Kiddoo, general sales manager, process equipment division, Air Products, Inc. "A recent example is the methane purification plant that we built for the Solvay division of Allied Chemical Corp. Here methane-rich natural gas is refined to 99.99% pure methane. The low-temperature purification equipment is self-contained in a compact 'package.'"

"Purification methods are the key to competition," says Dr. A. M. Clifford, manager of organic chemicals and plastics research at Goodyear Tire & Rubber Co. "Isoprene, for example, must be entirely free from methylacetylene contamination before it can be polymerized properly to polyisoprene."

Likewise, the manufacture of Delrin, Du Pont's new acetal resin, a polymerized formaldehyde, was made possible only after complete purification of the raw material could be accomplished.

The purity and uniformity of catalysts and reagents are considered by many manufacturers as the key to the new polymerization methods.

One important discovery in the field of catalysis is that of "coordination complex catalysis," which may be defined as the use of certain "coordination" additives to induce the catalyst to operate more efficiently or more quickly.

Adequate instrumentation is also an important factor in today's progress. "American industry could not have achieved the measure of success it enjoys today without the rapidly expanding new technologies of instrumentation," says Don G. Mitchell, president of General Telephone & Electronics Corp.

For example, improvements in the art of spectroscopy and chromatography make it possible now to detect minute traces of impurities, and to analyze them quantitatively in concentrations as low as a few parts per billion.

These advances in technology have made possible the development of new methods, and the production of useful new versions of many products.

Among the most interesting developments:

- Substantial progress in the development of fluoro-

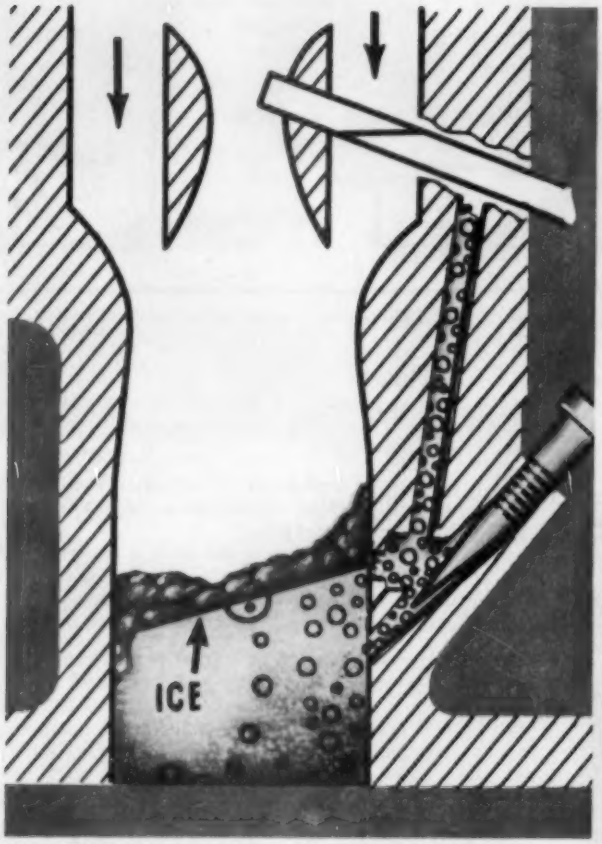
continued ▸

"There are two schools of thought concerning radiation chemistry today: the pessimists and the enthusiasts. We at Atlas are among the latter."

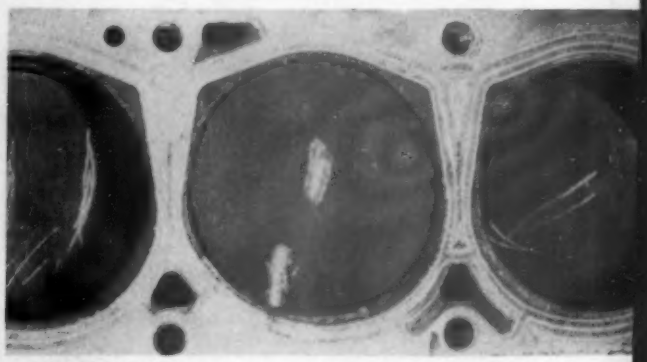
DR. WALTER H. C. RUEGGEBERG
Director of Chemical Research
Atlas Powder Co.

LOOK TO

FOR THE NEWEST IN "PRESCRIPTION-BALANCED" ADDITIVES



PARADYNE 41, an anti-stalling gasoline additive, prevents carburetor icing, the most common cause of engine stalling in the fall, winter, and spring seasons. Also prevents rust in fuel lines and fuel tanks. Saves money, too . . . appreciably reduces the amount of other phosphorus additives required to prevent misfiring and surface ignition.



PARADYNE 101, a new type of engine deposit modifier that helps to reduce surface ignition and spark plug misfiring — both critical causes of harmful engine knocking and power loss. Paradyne 101 contains chlorine scavenging agents. Benefits are twofold. Combustion chamber lead deposits are reduced...engine power and over-all efficiency are increased.

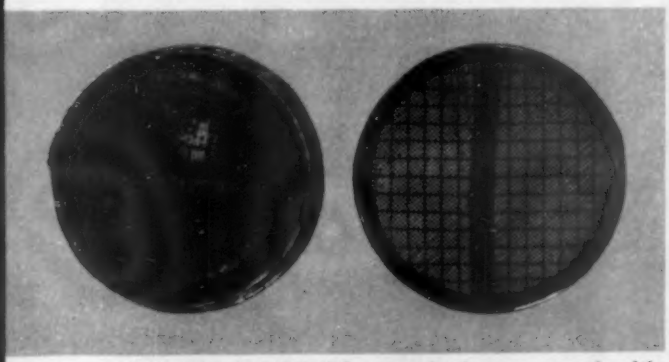
PARADYNE HO-10 AND HO-20, new, highly-efficient pour-point depressants designed for heating oils. End cold-weather troubles in a very wide range of base stocks and blends, and make possible maximum use of high-pour stocks.

What we mean by "Prescription-balanced" additives...

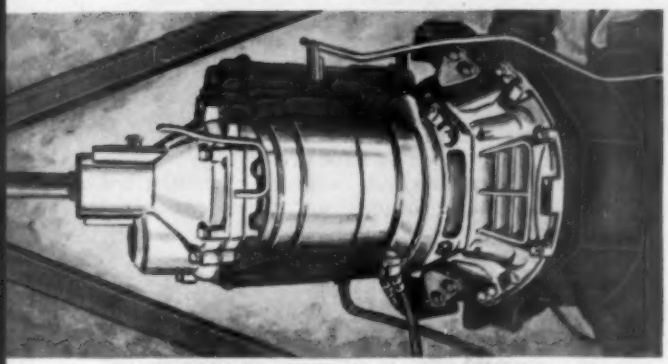
You tell us the characteristics of the product you want to market, and we will "prescription-balance" an additives package especially for you. Enjay Chemical Company is the only source for a complete line of superior quality additives for lubricants and fuels. It has unsurpassed experience, technical and research facilities for serving its customers, and the trained personnel who can custom-balance market-oriented "packages" for every base stock.

ENJAY

FOR FUELS AND LUBRICANTS



PARATONE 400 SERIES, a completely new group of multi-functional additives. Powerful sludge dispersants, as well as VI improvers and pour-point depressants. Essentially eliminates sludge deposits, even under the severest stop-and-go driving conditions.



PARANOX 375 provides exceptional oxidation stability to automatic transmission fluids. Combats sludge, varnish, and clutch lining deterioration. Provides sufficient lubricity for smooth shifting. Meets Type A, Suffix A requirements.

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detergent inhibitors retard oxidation and minimize creation of harmful deposits.

ENJAY PARATONE®
viscosity index improvers build high "VI" for cold-weather quick starting with low consumption and reduced friction characteristics.

ENJAY PARAFLOW®
pour-point depressants insure oil flow in cold weather.

ENJAY PARAFLOW®
dewaxing aid increases filter rate and dewaxing oil yield.

ENJAY PARABAR®
oxidation and rust inhibitors produce stable industrial oils that protect critical metal surfaces from corrosive effects of oxidation and moisture.

ENJAY PARADYNE®
oil and fuel improvers impart oxidation and anti-rust characteristics to fuel oil and gasoline.

ENJAY PARAPOID®
gear oil additives improve load-carrying and anti-yield properties of gear oils for protection of gears under extreme pressure service conditions.

ENJAY PARATAC®
lubricants tackiness agents impart cohesiveness to any oil or grease.

ENJAY PARAMIN MISCELLANEOUS PRODUCTS have been developed to solve many other performance and blending problems. Among these are color stabilizers, cast and outer tone modifiers, oiliness agents and metal deactivators.

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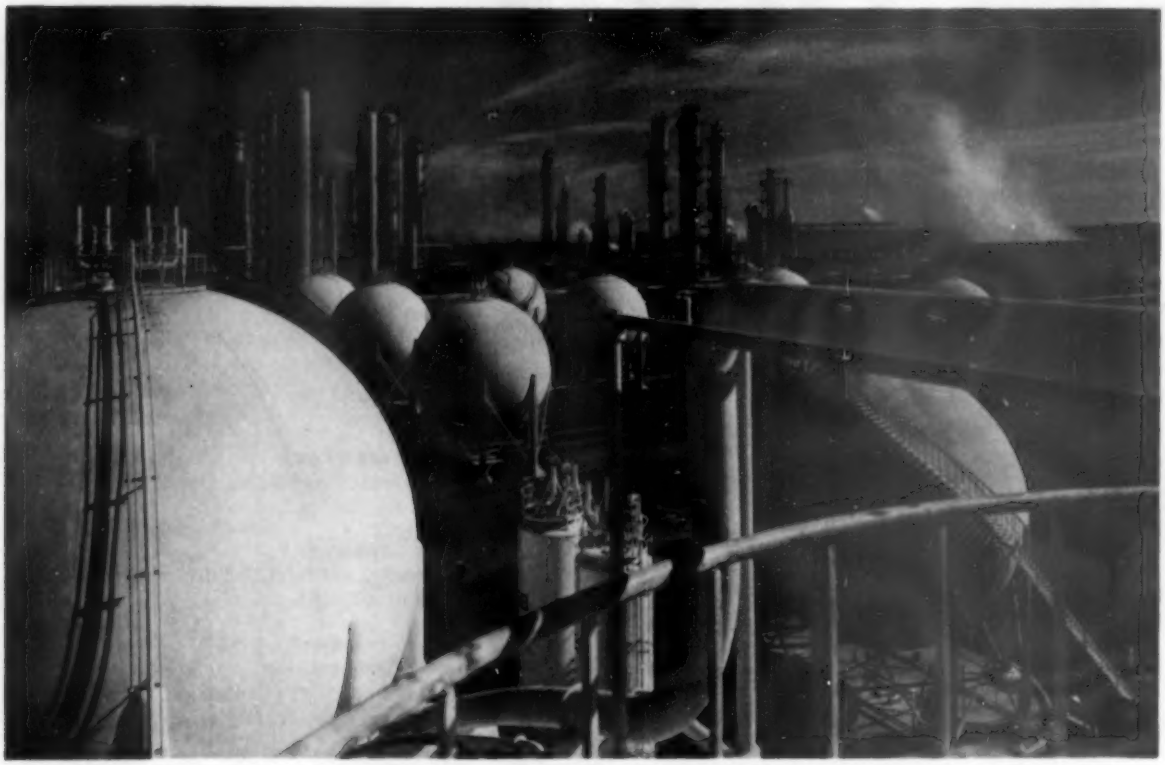
ENJAY CHEMICAL COMPANY

A DIVISION OF HUMBLE OIL & REFINING COMPANY

ENJAY
ADDITIVES



ISOBUTYLENE from this Houston (Tex.) plant of Petro-Tex Chemical Corp. will be converted to maleic anhydride.

carbons. These materials, of outstanding chemical inertness and great electric resistivity, are used in the form of films, fibers, or molded plastics in an increasing number of applications.

• The development of new types of paints for exterior application, based either on acrylic emulsions, trimellitic alkyd, or isophthalic anhydride.

• The use of adipic acid of extreme purity as an ingredient in food products, such as jams and jellies.

• The preparation of new polyester films of great dimensional stability, capable of replacing paper, glass, or metal in photography, drafting, and printing.

• The development of water-soluble resins for packaging, such as Union Carbide's Polyox (polymerized ethylene oxide) resins.

• The trend toward higher molecular weight in certain ionic detergents, for better sudsing ability and less skin irritation—for example, the use of higher alkyl benzenes instead of duodecylbenzene.

• The development of new types of epoxies and diepoxides (PW—Jul.6'60,p73), each new type having certain economical or technical advantages over earlier ones, such as lower cost, easier curing, or greater stability.

• A broader use of certain aromatics formerly little known. For example, the use of durene, and perhaps later of mesitylene, to produce, by nitric oxidation, pyromellitic and trimellitic structures with outstanding electrical and thermal resistance. Among these are a pyromellitic dianhydride-glycol combination, terephthalic acid, and dimethyl terephthalate intermediates.

Radiation chemistry may hold great surprises in store in the field of petrochemical development.

The most recent thinking on the subject, according to Dr. Rueggeberg, of Atlas, is that radiation chemistry will help make products that are structurally different from those that can be synthesized by conventional methods. It is expected, he says, that catalysts will be developed as promoters to bring the cost of radiation well below 5¢ per lb. of material.

continued ▸

"Research by the customer defines his needs. Technical service by the producer adapts the chemical to the use requirements of the customer."

DR. ROBERT L. BATEMAN
Director, Market Development
Union Carbide Chemicals Co.

ADDED SAFETY is an important benefit when you equip your loading rack with the only gear-driven swivel joint on the market. No danger of the operator slipping on wet or icy decking while pulling down a loading arm. No chance of arm dropping or rising unexpectedly to spill hot or caustic products. No counterbalance arms, cables or pulleys to endanger clearance on the platform. The entire loading operation is constantly controlled by this easy-to-crank joint.

TROUBLE-FREE SERVICE offers an equally important advantage. This gear-driven swivel joint incorporates all the proven features of C-E's popular US-Type Joint. It breaks like a union for quick, easy repairs on location without special tools. No need to disturb bearings when repacking. Wide-spaced bearings and non-split races last longer and permit greater foot/pound loading. Separate races can be reversed easily to double their life.

C-E Gear-Driven Swivel Joints are available in 2, 2½, 3 and 4 inch sizes — styles 3, 4, 5 and 6 — in mild steel or with stainless steel wettable parts.

For more years of service, less maintenance expense and a safer loading rack, equip it entirely with Continental-Emsco's Gear-Driven Swivel Joints. There's a size and type to meet every requirement.

Write, call or wire for the full catalog and price information.

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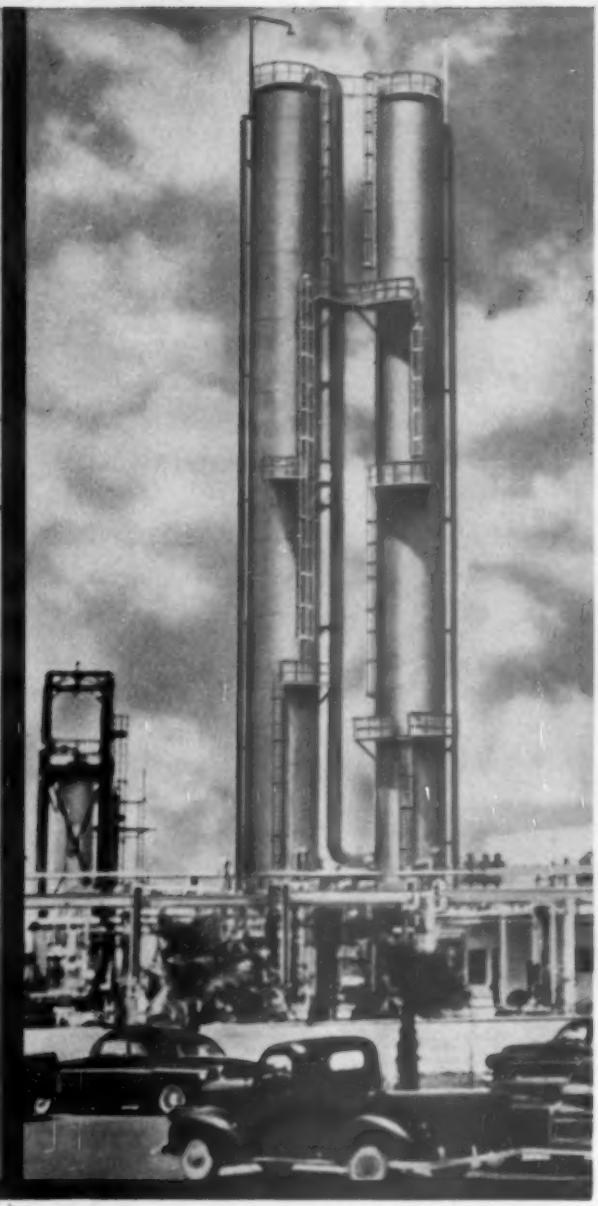

DELHI-TAYLOR'S Orthoxylene Plant on Stream...from inception to completion in only 6 months

Once again Delhi-Taylor has proved its reputation for performance . . . this time with the quick completion of its new orthoxylene plant to meet customer needs. The engineering survey was begun in January and material was processed on June 15! This is Delhi flexibility in action . . . its unique ability to expand into new petrochemicals with a minimum of delay.

■ The two 160 ft. high distillation towers, which feature unique plate design and arrangement, will be used primarily to produce high purity orthoxylene. The plant is designed so that other chemicals can be derived from the company's diversified petroleum and petrochemical feedstocks.

■ Delhi is now in production on high purity benzene, toluene, xylene, orthoxylene, higher boiling aromatics and a variety of aliphatic solvents. Our plant facilities are geared to move quickly in many new directions.

DELHI

CHEMICAL DIVISION

DELHI-TAYLOR OIL CORPORATION

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CORPUS CHRISTI • CHICAGO • CHARLESTON, S. C. • BATON ROUGE • HOUSTON

Polymers, Heart of the Industry

Outstanding among all techniques responsible for the development of today's petrochemicals is the science of polymerization, and the production of new polymers, copolymers, and polymer grafts.

Great progress is being made in the fundamental knowledge of the structure of matter. Molecules of petrochemical origin can now be polymerized to form new materials having specific desired qualities, such as:

- Tensile strength approaching that of metals and ceramics.
- Great rigidity, or great flexibility.
- High impact strength.
- Abrasive resistance.
- Chemical inertness.
- Resistance to high temperatures.

Certain of these properties, for example mechanical strength, are closely related to the molecular weight of the polymers, or more exactly to the degree of their polymerization, that is, the number of monomer molecules that are linked together.

Other properties, such as specific gravity, rigidity, melting point, depend only slightly on the degree of polymerization.

Besides the length of the molecule, another important factor controls the mechanical properties of a polymer—the orientation of the molecules that are linked together, and the number and position of side-chains within the polymer.

Furthermore, the nature of the chemicals involved results in certain intermolecular forces of various intensity: Certain groups—such as ethylene and butylene—produce relatively weak forces, while others—such as acetates, alcohols, or amines—have high values of molar cohesion.

These factors can now be used to strengthen a polymeric material in a three-dimensional network.

"During recent years," says Dr. Herman Mark, director of the Polymer Research Institute of the Polytechnic Institute of Brooklyn, "the systematic application of these principles has resulted in great progress in the improvement of thermal and mechanical properties of many high polymers."

Inorganic elements, such as magnesium, silicon, tin, titanium, or zirconium, are now being introduced into organic polymers to give them entirely new properties.

"The gap that still exists between the properties of metals and ceramics and those of synthetic organic polymers can now be bridged," says Mark, "by the application of entirely new methods of polymerization, involving the combination of organic and inorganic materials."

The progress in the tailoring of polymers to specific designs has been made possible by the parallel progress in the knowledge of catalysts.

The discovery of "coordination complex catalysis" (page 53) has led to the synthesis of all sorts of copolymers of ethylene, propylene, butylene, with the help of vinyl-type additions, and to the preparation of cis- and trans-polydienes, many of which show considerable promise.

For example, Dow Chemical Co. has developed a copolymer of its Saran with vinylidene chloride, which can be solvent-sealed or heat-sealed, and still remain entirely pliable. It is used for the lining of tank cars handling certain chemicals.

Rohm & Haas Co. has developed a sulfonated styrene-divinylbenzene copolymer as an ion-exchange resin, which is said to be remarkably resistant to chemical fracture and to oxidation.

Another factor of great importance has been the discovery that low-temperature polymerization must be kept absolutely free from water. This led to the synthesis of polyformaldehyde, and may lead, according to scientists, to many more polymers and copolymers of aldehydes, ketones, and epoxides.

One technique about which little is known at present, but which is certain to open new horizons in the field of polymerization, is that of "graft polymerization." Its mechanism is being investigated with the help of radiation chemistry. It should lead to dramatic developments in the months to come.

Today's Trend: Custom-Tailoring

Products manufactured from raw materials of petrochemical origin are increasingly being custom-tailored to fit specific needs.

"Production of a chemical without application research and technical service by the producer is the path to oversupply," says Dr. Robert L. Bateman, director, market development, Union Carbide Chemicals Co. "Demonstration of the utility of a chemical in a defined new use requirement is a road to growth. Abundant supply does not assure growth of a synthetic chemical in new applications."

Beyond the first conversion that makes a petrochemical intermediate out of a hydrocarbon, custom-tailoring has established itself as a rule. And frequently, the differences between two versions of the same basic product appear almost insignificant.

No longer is polyethylene represented by one resin, which can be made either into a film or into an extruded plastic; there are today literally dozens of versions of the low-density as well as of the linear, high-density polyethylenes.

A recent list of Marlex polyethylenes manufactured by Phillips Chemical Co. lists 15 different high-density resins, varying in density from 0.94 to 0.97, and 13 medium and low-density resins, varying from 0.914 to 0.941. Each of

continued ▶

"The manufacturer who goes beyond a first conversion from a hydrocarbon to a petrochemical must gear up to do virtually as much end-use application research as his customers, if he is going to succeed in his venture."

DR. N. C. ROBERTSON
Vice-President, Research & Development
Spencer Chemical Co.

these differs from its neighbors by a small property: melt index, tensile strength, elongation, softening temperature, environmental stress-cracking, or stiffness.

There are today over 60 types of cellophane, 35 to 40 types of Du Pont's dimethyl terephthalate film "Mylar," an unbelievable number of varieties of nylon, and so on.

Most manufacturers say that, in view of today's stiff competition, a company must be able to custom-tailor its product to its customer's requirements even though the difference between the new product and an existing one seems insignificant.

"Even small differences are usually significant in a customer's process," says John Worrell, market development manager of Wyandotte Chemicals Corp.

And a spokesman for a major oil company actively engaged in petrochemical manufacture says: "Two main reasons justify the making of special products for special applications. First, we must satisfy our customers by giving them a product which they think satisfies their needs more exactly; second, we like to give our products a small competitive edge over others, since we would rather be selling "specialties" than "commodities."

F. Faxon Odgen, director of chemicals product development at Atlas, cites this example:

"Atlas additives are used in the manufacture of tires and man-made fibers. But the additive that one manufacturer uses successfully will often not satisfy another, although the process he employs is identical, and even though we can offer him that same additive at a substantially lower price than the one he favors."

"What we may think is unconsequential on scientific grounds," says C. E. Bethel Jr., administrative assistant to the general manager of the petrochemical department of Continental Oil Co., may be important to a customer because of his advertising—or perhaps merely because of his traditional usage."

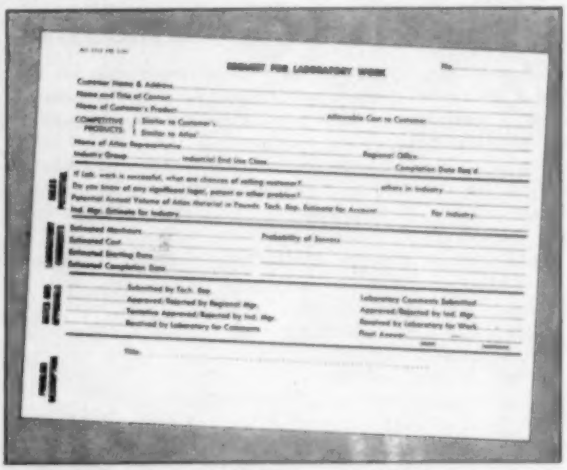
Manufacturers may decide to put a new version of a product on the market for many reasons.

Among those who participated in the PETROLEUM WEEK survey, 65% indicated that they did it to develop a new market, 50% to answer a customer's request. A few mentioned that the introduction of a new product was sometimes beneficial in simplifying production, or reducing its cost.

Putting a new product—or a new version of an existing product—on the market, is generally an elaborate procedure.

Here are the steps that Atlas Powder takes.

- The technical services division submits a "request for laboratory work" (picture, above).
- From that request, a "development program proposal" is prepared. It is based on a "market research report." In it, the proposed product is evaluated in terms of total market and in terms of the company's estimated share of that market.


REQUEST FOR LABORATORY WORK

PROPOSALS FOR NEW PRODUCTS are always considered with great care. At Atlas it begins with a request from the field.

- The controller's division studies the investment required. It considers, among other factors, the costs of field development, chemical research, laboratory work, engineering, plant requirements, and advertising and sales promotion.
- The division manager who will be in charge of the new product, and who will be expected to make a profit with it, is consulted.
- Finally, if everything is favorable, approval is requested from the executive committee.

A somewhat similar procedure is followed by most of the leading manufacturers of petrochemicals.

"The shuttle between the technical services division and the research laboratories of a company is one of the basic mechanisms of progress," says Union Carbide's Bateman. "Technical services, which are customer-oriented, spell back for research the customer's actual needs, and research works out a solution for him.

"This is similar, in fact, to what the oil industry has been doing for years, but the oil industry processes only a few major end products, compared to the hundreds of major products made by the chemical industry. UC has been progressing, thanks to its 'Products Application Service,' for better than 30 years.

"A good phonograph record material does not make a good shower curtain nor a good beer can coating, yet all three are vinyls.

"The key to orderly growth is a constant attention to the development of materials to satisfy new users or to overcome a shortcoming in an existing material."

continued ▸

"The number of resins made in our division has grown for two reasons: We know more about the requirements of their users, and we know more about how to make them."

BAILEY H. BARNES
Assistant Manager of Plastics Sales
E. I. du Pont de Nemours & Co.

Plastic-foam pillow was one of the products made from Sinclair petrochemicals that stockholders saw.

All the Talk's about Sinclair Petrochemicals

Sinclair's continuing petrochemical progress was a prime topic of conversation at the Company's annual meeting of stockholders this year.

- The volume of chemical sales in 1959 doubled that of the previous year, and the 1960 volume to date is even better.
- Sinclair is now the largest producer of paraxylene, the basic raw material for polyester fibers used in the popular wash-and-wear fabrics.
- Sales of the plastic raw material, high purity propylene, first made in this country by Sinclair, are at an all-time high.
- In a joint undertaking with Koppers Company, Inc., a major plant is being built at Houston, Texas to produce styrene monomer, a synthetic rubber and plastics raw material.

Stockholders were told that this rapidly expanding field is "an excellent route for product diversification, and an important new source of profits".

Sinclair

A Great Name in Oil

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Old Products Never Die

Very seldom, however, does the introduction on the market of a new product, or of a new version of an existing one, cause a similar product to be eliminated as obsolete.

The survival of products which, logically, should be displaced by a new product having generally superior qualities is one of the major paradoxes of the petrochemical industry.

One good example is the survival—and indeed the increasing use—of cellophane. In the past few years, many packaging films have been developed that have properties in many ways superior to those of cellophane. Among them are polyethylene and polypropylene, both coated and uncoated, oriented, and irradiated. Yet in 1959, the sales of cellophane reached a record high of 456-million lb., exceeding the 1958 sale by 33-million lb.

Other examples include the survival of many of the old types of plastic resins, such as the phenolics, and the continued growth of low-density, nonlinear polyethylene.

A point may therefore be reached where excessive custom-tailoring becomes a handicap.

Among the manufacturers surveyed by PETROLEUM WEEK, the rubber companies in particular pointed out the drawbacks of excessive 'diversification.' Due perhaps to a tendency on the part of the salesmen to follow the line of least resistance in their discussions with clients, and to the desire of the companies to meet competition at any cost, plant inventories have become overburdened with a maze of products differing from each other by a few Mooney points (an indication of rubber viscosity), or simply by the method of packaging. That condition complicates manufacturing operations, warehousing problems, and sales efforts.

"As producers of a wide line of general purpose rubbers," says Clayton F. Ruebensaal, Director of Commercial Planning of Texas-U.S. Chemical Co., "we are obligated to make SBR polymers that are only at slight variance with one another. Naturally unit production costs are increased due to stopping and starting production lines. A lot lower turnover is experienced because of complicated storage and packaging problems. Sales costs are also increased because of added sales promotional expense in identifying and promoting this large number of product variants."

"When the U.S. government turned its synthetic rubber plants over to private industry after World War II, chaos set in," says one of the largest consumers of synthetic rubber for nontire applications. "There are well over 100 varieties of SB rubbers today; even Neoprene, a Du Pont product without competition, has now several varieties. The situation is very serious."

"One possible way out of the chaos," according to a government source, "would be the development of international specifications for the large-volume rubbers. The International Organization for Standardization, Technical Committee 45, could bring pressure to bear on the American manufacturers who are doing business abroad. The American Standards Assn., in New York, which is the official representative of that organization in the U.S., has delegated its responsibility to the American Society for Testing Materials, which, in turn, lets its committee on rubber handle the technical aspect of the problem for the U.S."

Standardization May Help

Better user education and closer standardization within each branch of the industry may help to curb the handicap of excessive custom-tailoring.

Most of the manufacturers surveyed by PETROLEUM WEEK are in favor of some sort of standardization. The areas indicated as particularly in need of it are first the plastic films, then the elastomers.

But all agree that it should be strictly an industry undertaking, that it is not a government problem.

Wyandotte's Worrell has this to say: "I think there is too much regulation and standardization now. There is no need to emphasize this overdiversification condition until we cause some federal agency to step into it. A producer group providing minimum specifications for acceptable products is all that is needed."

That is exactly what The Society of the Plastics Industry is doing. It is promulgating voluntary commercial standards for the various branches of the plastics industry, under sponsorship of the U.S. Dept. of Commerce, with the cooperation of the National Bureau of Standards. SPI feels that such standards help to keep the situation in hand within the industry.

And the formation of the International Institute of Synthetic Rubber Producers, which should be an accomplished fact in a few weeks, may well be instrumental in working out some means of standardization in the synthetic rubber industry.

SPI is also responsible for a substantial amount of informative material being passed on to processors and users of all types of plastics.

This information is geared to two distinct levels. For the laymen, who constitute the great mass of users of plastics, SPI has a 40-page booklet, and puts out, at frequent intervals, informative pamphlets, statistical data, and a catalog of movies made available by member-companies. For the technicians, it has recently brought out the 3rd edition of its very complete "Plastics Engineering Handbook."

REPRINTS AVAILABLE

Reprints of this report are being prepared and will be available in September. Single copies will be sent to PETROLEUM WEEK subscribers on request without charge. Additional copies will be billed at the following rates: 1-10 copies, 50¢ each; 11-100, 40¢ each; 101-1,000, 30¢ each; over 1,000, 20¢ each. Address orders to:

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DU PONT *Petroleum Chemicals* NEWS

Number 103 in a series of bulletins for the Petroleum Industry

AUGUST 1960

Du Pont reports on the progress of linear programming

HERBERT O. BAILEY and JACK S. BELLAH, refinery technologists, discuss the programming of a customer's refinery operation.

The purpose of the Du Pont linear programming service is to help refiners look at *both* the forest and the trees – to analyze the economic effect of every processing and blending phase, and from this analysis obtain an over-all view of the economy of a particular refinery's operation.

In one instance, linear programming showed how a company was losing over $1 per barrel by diverting one component to a less profitable alternate use.

In another case, a company learned that it was buying a component at a price considerably above its actual value to them.

Du Pont has now expanded the scope and capabilities of its linear programming service. The past and the future of this service are explored in the statements on this page by Jack S. Bellah and Herbert O. Bailey, Du Pont refinery technologists.

Linear programming up to now by Jack S. Bellah

"In the past two years the many customers who have utilized our linear programming service have found it to be a useful adjunct to their over-all refinery operations and planning.

"On occasion, the analyses they received opened the door for changes which could effect appreciable economies. In other instances, results have verified that the *modus operandi* of the refiner was already at the optimum.

"Du Pont instituted this service with two purposes in mind:

"First, as a study of a customer's actual operations – to develop the over-all economic picture of his gasoline blending operations, putting all factors into their proper economic perspective when maximizing profit. From this, much information can be readily developed on the effect of varying elements of the system.

"Second, where the customer is interested in linear programming as a permanent tool in his own economic studies, a trial run by Du Pont can give him experience on which to base his own choice of programming system. In some cases, Du Pont has helped to train those persons who will make the actual studies, and has continued to suggest ways in which the studies can be broadened into more comprehensive and useful management tools."

The future for linear programming

by Herbert O. Bailey

"We expect to expand the Du Pont linear programming service by introducing more customers to it and by exchanging ideas, concepts and methods with those who have already started using it.

"One new approach is our use of the IBM 704 computer. The larger memory capacity of this machine helps us assist our customers in studying larger and more complex problems, including: maximizing the profit on numerous grades of gasoline; interseasonal storage of gasoline and heating oil components; complete refinery simulation from crude to finished products.

"On the 704 we can, within reasonable limits, incorporate in a single problem the combination of variables that determines:

a) Selection of crude slates.

b) Determination of reforming severity level and tetraethyl lead concentration for minimum cost research and motor octane numbers.

c) Choice of catalytic cracking plant feed stocks.

d) Disposition of butanes among motor gasoline, alkylation or polymerization plant feed stock.

e) Component and finished product production within process capacity limitations, and with all finished products meeting specifications.

f) Size of profitable marketing areas."

ADVERTISEMENT—Prepared for the Petroleum Chemicals Division of E. I. du Pont de Nemours & Company (Inc.)

OVER

DU PONT *Petroleum Chemicals* NEWS

ATTENTION MARKETERS:

New survey probing motorist buying habits soon to be released

Now in the final stages of compilation is the 1960 Du Pont survey, "Profile of the Motorist". This is the fourth in a series that constitutes the largest such study ever undertaken in the petroleum industry.

Coast-to-coast interviews (4,500) are shedding new light on old questions, such as: gasoline brand preference, loyalty to service stations, the effect of price wars on buying habits, regular-vs-premium grades, and non-petroleum purchases at service stations.

Other areas of particular interest include: the growing use of non-oil company credit cards, vacation use of automobiles, the effect of trading stamps and activities that compete with driving (such as home swimming pools, daytime television).

This study is another example of the marketing services available to Du Pont customers. Results will be available this fall.

Du Pont study shows fewer gasolines cause carburetor icing

Results are now available to marketers and refiners from the *Winter, 1960,* Du Pont Survey of Carburetor Icing.

30 regular grade gasolines, 30 premiums, and 4 super premiums were investigated. Samples were obtained from service stations in various marketing areas, with particular emphasis on regions where carburetor icing has been most prevalent.

Contrasted with results of the 1959 survey, it appears that there was a general decrease in the tendency of motor gasolines to cause carburetor icing:

47% of *regular* gasolines were satisfactory, compared with 35% in 1959.

63% of all *premium* gasolines were satisfactory, compared with 55% in 1959.

Full information on this study – including the comparison with last year – is available from your Petroleum Chemicals Division representative.

Western Regional Manager

E. HEARN SIMPSON, who recently assumed the duties of Western regional manager for Du Pont's Petroleum Chemicals Division, brings more than twenty-four years of petroleum experience to his new position. He succeeds the late Robert F. Harwick.

Mr. Simpson started with Du Pont in 1930 in the sales department of the "Fabrikoid" Division, Newburgh, N. Y., and two years later became a sales correspondent in the Alcohol Division of the Organic Chemicals Department in Wilmington, Del. In 1934 he became a salesman in the same division, where he was concerned with the sale of gasoline antioxidants, oil colors, and alcohol in the Middle West.

From 1943 until 1946 Mr. Simpson was a supply officer in the U. S. Navy. He returned to Du Pont in 1946 as sales manager of the alcohol and camphor section, Petroleum Chemicals Division, and a year later was named assistant sales manager of petroleum additives. In 1950 he was appointed manager in charge of industrial sales for the Petroleum Chemicals Division and the following year was named acting manager of the Eastern Region with headquarters in New York City. In 1952, Mr. Simpson returned to Wilmington as manager of sales of the Petroleum Chemicals Division, a post which has now been discontinued.

A native of Washington, D. C., Mr. Simpson attended public schools in Delaware, Oklahoma, and Colorado, and joined Du Pont following graduation from the University of Denver with a bachelor of science degree in 1930. He is a member of the American Petroleum Institute.

New Du Pont yellow dye is 20% stronger, more soluble

Now you can add yellow color to gasoline and other petroleum products more readily with Du Pont's new Oil Yellow NB. This new dye is 15% to 20% stronger than its predecessor, Oil Yellow N.

Use less dye. With Oil Yellow NB you use less dye to get the same results obtained up till now with Oil Yellow N.

Improved solubility. Another advantage of Oil Yellow NB is its greater solubility in petroleum products. Its approximate solubility, ascertained from test samples, is 4000 mg/100 ml in a test gasoline, compared to approximately 2000 mg/100 ml for Oil Yellow N.

Now available. Deliveries of Oil Yellow NB are now being made from our plant at Carneys Point, N. J., and from warehouses across the United States. The dye is shipped in standard 100-lb.-net packages.

With Oil Yellow NB you can add the advantage of *faster dyeing* to that of *lower dye requirements.* For additional information and samples, contact your Du Pont representative.

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Du Pont Tetraethyl Lead and other Petroleum Additives

OVER

ADVERTISEMENT—Prepared for the Petroleum Chemicals Division of E. I. du Pont de Nemours & Company (Inc.)

A-15405

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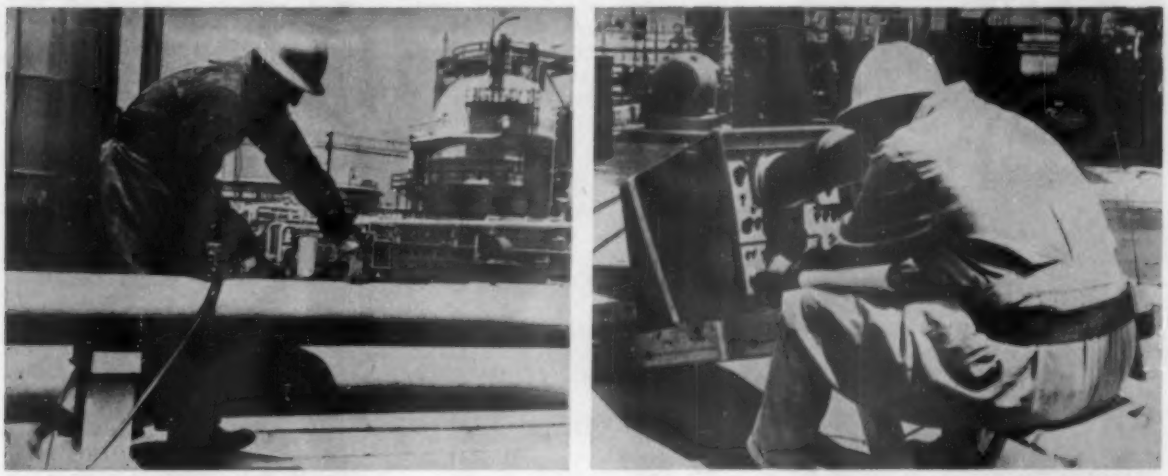


ULTRASONIC INSPECTION of a pipe is done by two men: One scans the surface of the metal with an Ultracoupler (left); the other (right) observes on an oscillograph the curves that reveal wear or internal flaws. They are doing . . .

On-Stream Inspection by Seismography

The principle of seismography—the study of underground formations by reflection of sound waves—can now be applied to the inspection of refinery equipment.

In the exploration segment of the petroleum industry, seismography is used to detect geological formations far below the surface of the ground by the manner in which sound waves —produced by a mild explosion— are reflected to the surface.

The new "Ultrasonic" inspection method, developed by Electric Circuits, Inc., and recently purchased by International Inspection, Inc. (Triple-Eye) works along the same principle (PW—Jul.22'60,p25).

High-frequency vibrations from a crystal transducer are applied to the surface of the vessel to be inspected. The way the vibrations are reflected indicates the condition of the equipment.

For Triple-Eye inspection, a lithium sulfate transducer is charged with alternating electrical current and caused to vibrate at millions of cycles per second.

The high-frequency sound is directed against the surface of the pipe, or vessel, that is being inspected. This ultrasound is then reflected to the transducer, first as it strikes the external surface of the metal, then as it reaches the internal surface, and also when it hits any crack or flaw within the thickness of the metal.

Each of the reflections of ultrasonic energy picked up by the transducer is displayed as a separate curve on an oscillograph, connected by wire to the transducer (picture, above).

The distance between these curves on the oscillograph tells the story. When the two curves (representing the external and internal metal surfaces) remain parallel, there is no appreciable wear of the metal. But when the distance between two curves decreases, it shows that the thickness of the metal has been reduced at that point—in other words, that there is internal wear or pitting.

And when an additional curve, or a line of additional pits, shows up, this indicates that there is an irregularity—crack or flaw—in the metal.

Water is used as transmission medium between the crystal transducer and the equipment that is being inspected.

Since ultrasound does not travel well through air, a small flow of water is maintained through the "ultracoupler," the working head of the inspection device. This water flows between the crystal transducer and the surface of the equipment; the water simply runs off that surface, or turns into steam.

Triple-Eye says a negligible quantity of water is required, and the production of steam does in no way handicap the reading.

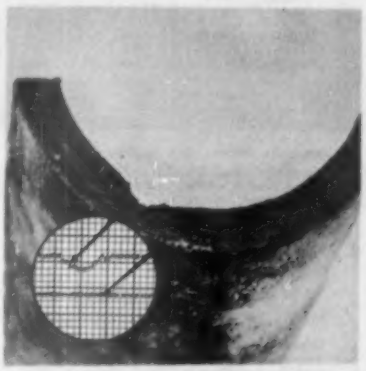
Several major refiners in the Houston-Port Arthur-Gulf Coast area are now using this inspection method on a daily basis, Triple-Eye says, and are discussing yearly contracts.

These advantages are claimed for the Ultrasonic inspection method:

- On-stream inspection can be carried out regardless of the temperature of the vessel.
- Readings are not affected by the presence of coke or other internal deposits.
- The exact position and depth of pits, cracks, or flaws can be determined.

Triple-Eye says that the method is being used to inspect all sorts of tubular equipment, pressure vessels, storage tanks, and boilers, as well as welds of all types.

Complete "scanning" of a large metal surface can be accomplished in a relatively short time.



HOW INTERNAL PITTING would appear on the oscillograph.

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Radiation Used to Study Plastics

Practical conclusions can be drawn from highly scientific tests that are being conducted to study the effects of radiation on plastics.

Constant Wippler, of the research laboratories of Compagnie de Saint Gobain, near Paris, France, reports, in the August issue of Nucleonics, a McGraw-Hill publication, the action of radiation on polyvinyl chloride, both in solutions and in pure powder form, and the influence that various commercial additives have on the irradiation process.

Appearance, density, solubility, and mechanical characteristics of the PVC mixtures were studied, after irradiation with Cobalt 60.

These tests were carried out with pure polyvinyl chloride, and with commercial specimens containing various plasticizers and stabilizers.

Commercial PVC, with which most previous researchers had done their experiments, contains additives, such as plasticizing and stabilizing agents, and these, Wippler reasoned, may substantially affect the results. The tests seem to bear him out.

Pure polyvinyl chloride becomes permanently colored under the influence of gamma radiation, while the plasticized PVC is less subject to color changes.

These results will be of value to manufacturers of equipment for high-altitude flying, and other applications where plastics may be exposed to intense nuclear radiation.

Most of the plasticizers, it was found, do not affect the mechanical properties very much.

Three plasticizers were studied: tricresyl phosphate, butyl phthalate, and dioctyl phthalate. The TCP product, after irradiation, showed an increase in Young's modulus and a decrease in stretch modulus, Wippler says.

As for stabilizers, lead or sodium stearates seem to give the best stabilizing protection.

Four stabilizers were used for the tests: two stearates, one organo-tin derivative, and one diphenyl thio-urea (DPTU).

Wippler discovered that the greater the concentration of stabilizers in the plastic, the greater the variations of its physical properties caused by irradiation. He found that stabilizers protect PVC from color change in the following decreasing order: the stearates, then DPTU, then the organo-tin product.

Before testing pure PVC, a technique was developed with PVC in various solutions, as an easier way to determine what structural changes can be attributed to radiation.

Experiments on PVC solutions are particularly convenient, Wippler pointed out, because they make it possible to study radiation effects as related to intermolecular distance.

Conclusions as to structural modifications that occur in the PVC can be drawn from changes observed in its physical properties, such as:

- Average molecular weight.
- Intrinsic viscosity.
- Solubility in tetrahydrofurane, with various concentrations of PVC in the solvent, and with increasing doses of irradiation.

The physical changes appear to be due to two sorts of structural modifications caused by radiation: a linking within the molecules, and a cross-linking between adjacent molecules.

The first type of linking takes place at low concentrations of PVC in the solvent. It results in a shrinkage in the size of the molecule, and a decrease in viscosity.

The second change takes place at higher concentrations, and results in a substantial increase in viscosity, in molecular weight, and in insolubility in tetrahydrofurane of the gel recovered after irradiation.

On the other hand, Wippler points out, there is no splitting of the PVC molecule—sometimes referred to as "degradation."

A minimum irradiation dose of 3×10^7 roentgens seems to be the "threshold" below which no action is observed.

Furthermore, below a critical concentration of 4-4½%, there appears to be a maximum threshold dose, above which no further change occurs. Above that concentration, there appears to be no maximum.

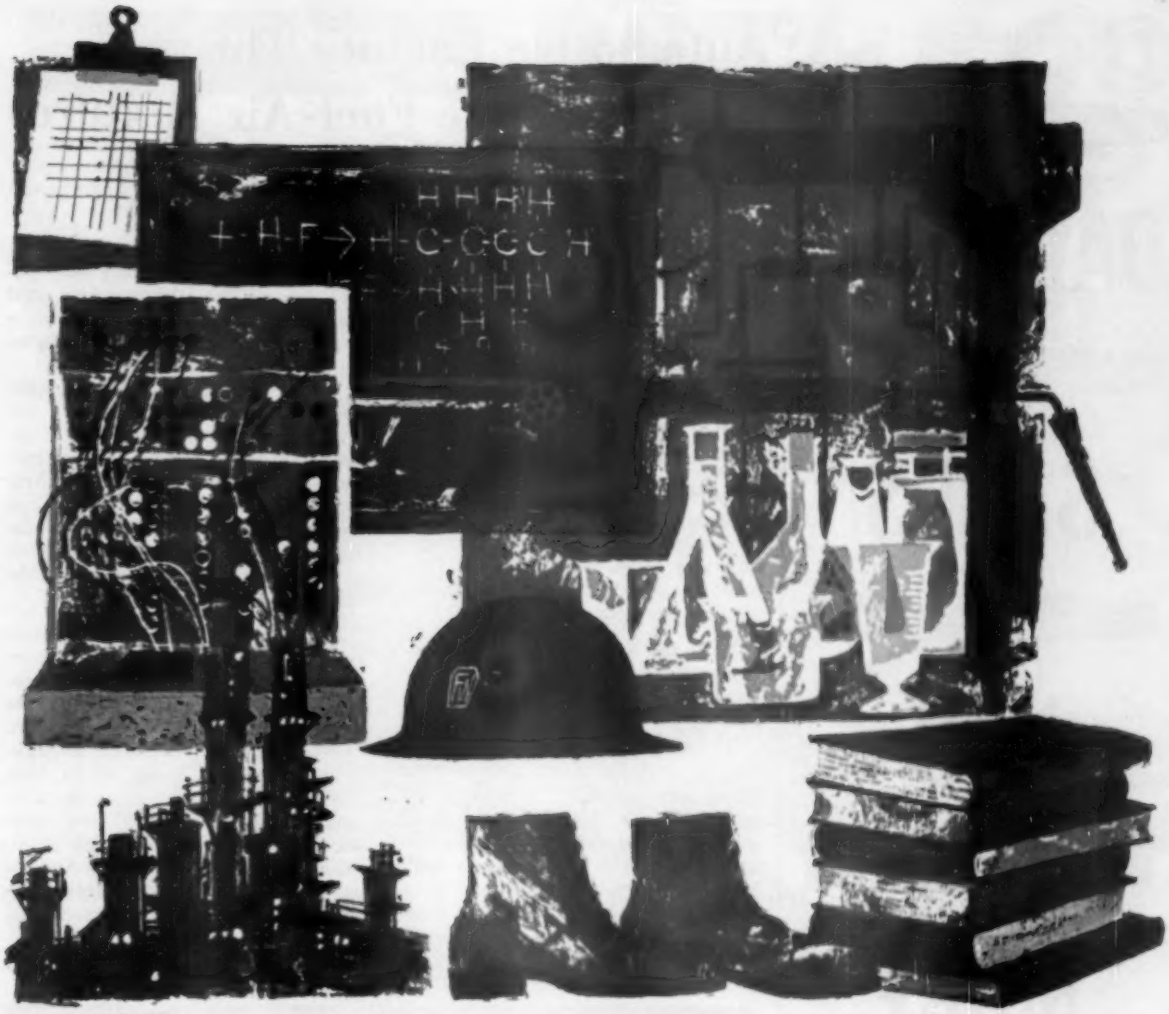
Substantial differences in the results were observed with different solvents.

This, Wippler feels, is due to the fact that irradiation of PVC generates a certain amount of chlorine and hydrochloric acid, which affect the various solvents differently.

Tests were also conducted at various temperatures, and under vacuum.

It was found, says Wippler, that PVC irradiated under vacuum, then exposed to air, undergoes rapid chemical changes, no doubt due to oxidation.

And these changes can be accelerated by heating the specimens.



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Automotive Engines Thrive On Variable Fuel-Air Mixtures

Great improvement in gasoline engine combustion can be achieved with "modulated carburetion," according to the French Petroleum Institute (IFP).

Tests are being carried out in an experimental engine at IFP, over the entire range of normal operation of an automobile.

Instead of maintaining constant the rate of gasoline-vapor and air in the mixture introduced into the engine, a very lean mixture is used at low loads, and an increasingly rich mixture is added as the power output goes up.

Actually the mixture is kept leaner than is conventionally the case throughout most of the cylinder; the enrichment is done locally, in the vicinity of the spark plug.

With this variable-richness carburetion, carbon monoxide in the exhaust gases—an index of incomplete combustion—is virtually eliminated.

The CO content, the institute says, can be kept at practically zero at idling speed—0.008% instead of the usual 2% to 6%—and at about 0.048% at 3,000 rpm. against the 2% around which it would hover with conventional carburetion.

As a result of more complete combustion, fuel consumption decreases by about 10% over the entire power range, up to 95% of the engine's full power output.

Modulated carburetion is accomplished by admitting a very lean mixture through the inlet manifold, and then adding a rich mixture, from a second carburetor, in the higher ranges of power output.

When the power output reaches 50% of maximum, an auxiliary carburetor automatically cuts in; it delivers a rich air-gasoline mixture into the cylinder through a ¼-in. tubing opening near the spark plug. From one-half to full power output, the throttle controls only the degree of richness of the mixture entering the cylinder.

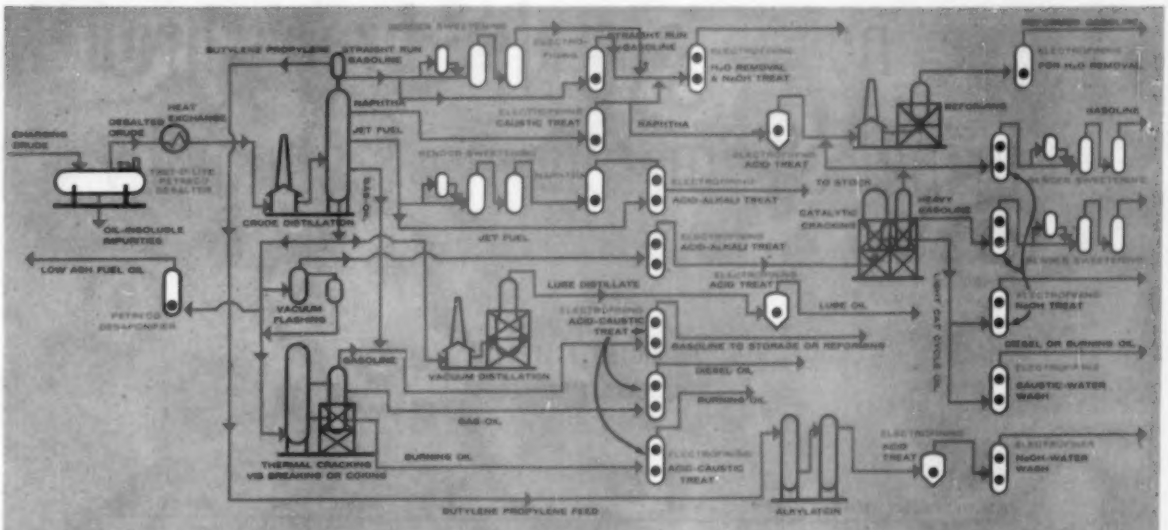
Experiments are now being conducted on a commercial multicylinder engine, and it is believed that a single carburetor can be designed to provide both lean and rich mixtures.

The work was started on a single-cylinder engine of about 3¼-in. bore, 500-cc. capacity, and a compression ratio of 7 to 1. But, IFP says, tests are now showing encouraging results with a mass-produced engine. And the institute is trying to devise better ways of introducing the rich mixture, possibly with some reheating.

Esso's Rotterdam Refinery On Stream

Esso Nederland has put its $50-million, 100,000 b/d refinery on stream at Rotterdam. The plant incorporates many recent refinements, including Powerforming, Hydrofining, and an electronically controlled loading system. The refinery was built on 10-million cubic yards of "created land," laced with more than 2,000 piles. The prime contractor was the Dutch affiliate of Badger Mfg. Co., Cambridge Mass. Esso Nederland is a wholly owned subsidiary of Standard Oil Co. (N.J.)

PRODUCT IMPROVEMENT WITH **PETRECO**



This flow diagram shows how Petreco equipment can be applied to various refining problems to improve product quality at minimum investment. (1) PETRECO* Electric Desalting or TRET-O-LITE* Chemical Desalting units purify charging crude. (2) ELECTROFINING* Precipitators perform a variety of distillate treating operations. (3) PETRECO-BENDER Catalytic Sweetening Process treats distillates in the No. 2 fuel-kerosine-gasoline range to provide a sweet, non-corrosive product. (4) PETRECO Lube-Acid Treating provides continuous, automatically-controlled, acid treatment for lubricating oils and similar stocks in a closed non-air-polluting system. (5) PETRECO Desaponification Process removes about 85% of the ash-forming constituents from fuel stocks, enabling them to be marketed advantageously or used as charging stock for cracking.

Other Petreco purification processes available but not shown in the diagram include units for dehydration and sediment separation.

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Also, planning purification and treating installations at the preliminary design stage allows adequate time to determine exact equipment needs. The Petreco engineering staff is always available for consultation. Call on Petreco for help with *any* purification or treating problem, whether it's on the drawing board or in an operating refinery.

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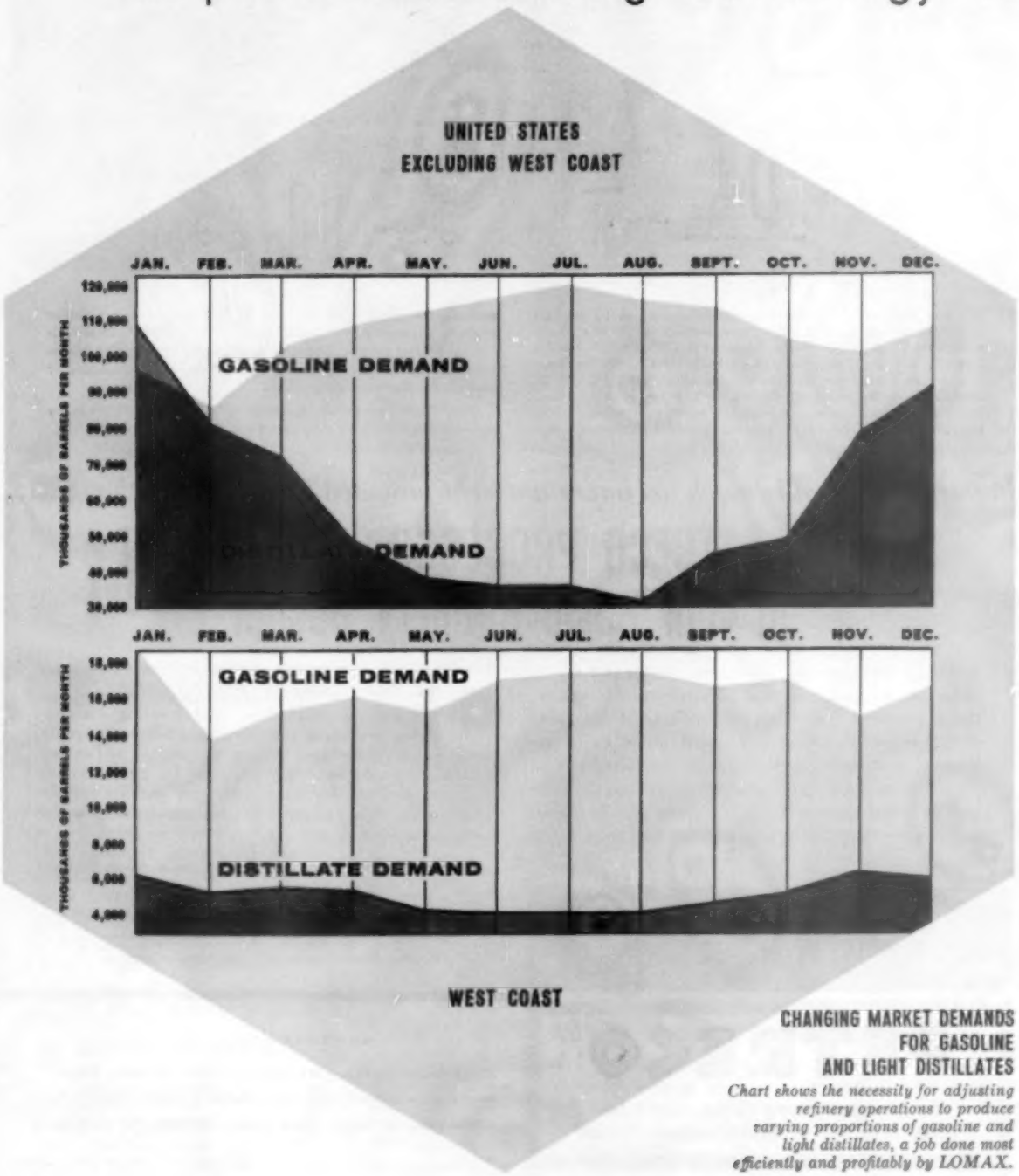
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THOUSANDS OF BARRELS PER MONTH
GASOLINE DEMAND
DEMAND
JAN. FEB. MAR. APR. MAY. JUN. JUL. AUG. SEPT. OCT. NOV. DEC.
THOUSANDS OF BARRELS PER MONTH
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Chart shows the necessity for adjusting refinery operations to produce varying proportions of gasoline and light distillates, a job done most efficiently and profitably by LOMAX.

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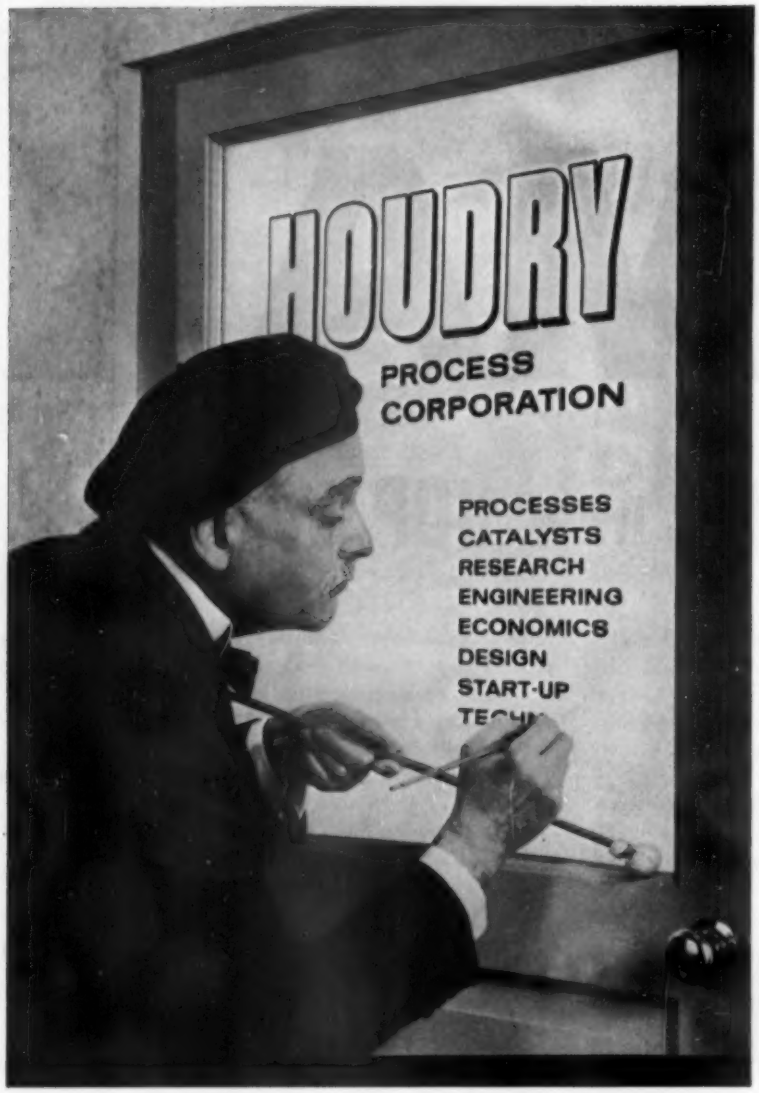

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A good many petroleum and chemical processors have found profitable reading in the growing list of "what Houdry does."

Availability of contract research, for instance, enables processors to "farm out" projects ranging from development of theories to pilot plant tests of processes and chemicals. Houdry contract technical service helps keep plants operating at peak performance levels.

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What's New

IN PROCESSING

Latest newcomer in the petrochemical field: Sunray Chemical, wholly owned subsidiary of Sunray Mid-Continent Oil Co.

The company will handle research, manufacturing, and sales of petrochemicals. It will start by building or acquiring facilities for the production of polyethylenes, polypropylenes, and naphthalene. Glenn E. Wynn, formerly president of Suntide Refining Co., is president of the new chemical company.

•

El Paso Natural Gas Products Co. has announced that construction will begin immediately on an addition to its Odessa (Tex.) Styrene plant.

The capacity will be increased from 60-million lb. to 80-million lb. per year. Universal Oil Products Co.'s recently developed Alkar process (PW—Nov.20'59,p38) will be a part of the expansion.

•

Continental Oil Co.'s Anotrol system for the electrochemical control of corrosion (PW—Oct.30'59,p30) is being made available through a world-wide license agreement with Minneapolis-Honeywell Regulator Co.

The Anotrol system has been tested for several years by Conoco in its plants at Ponca City, Okla., Gretna, La., Baltimore, and Chicago.

It will be offered initially for the control of corrosion in the processing and storage of certain acids and caustics.

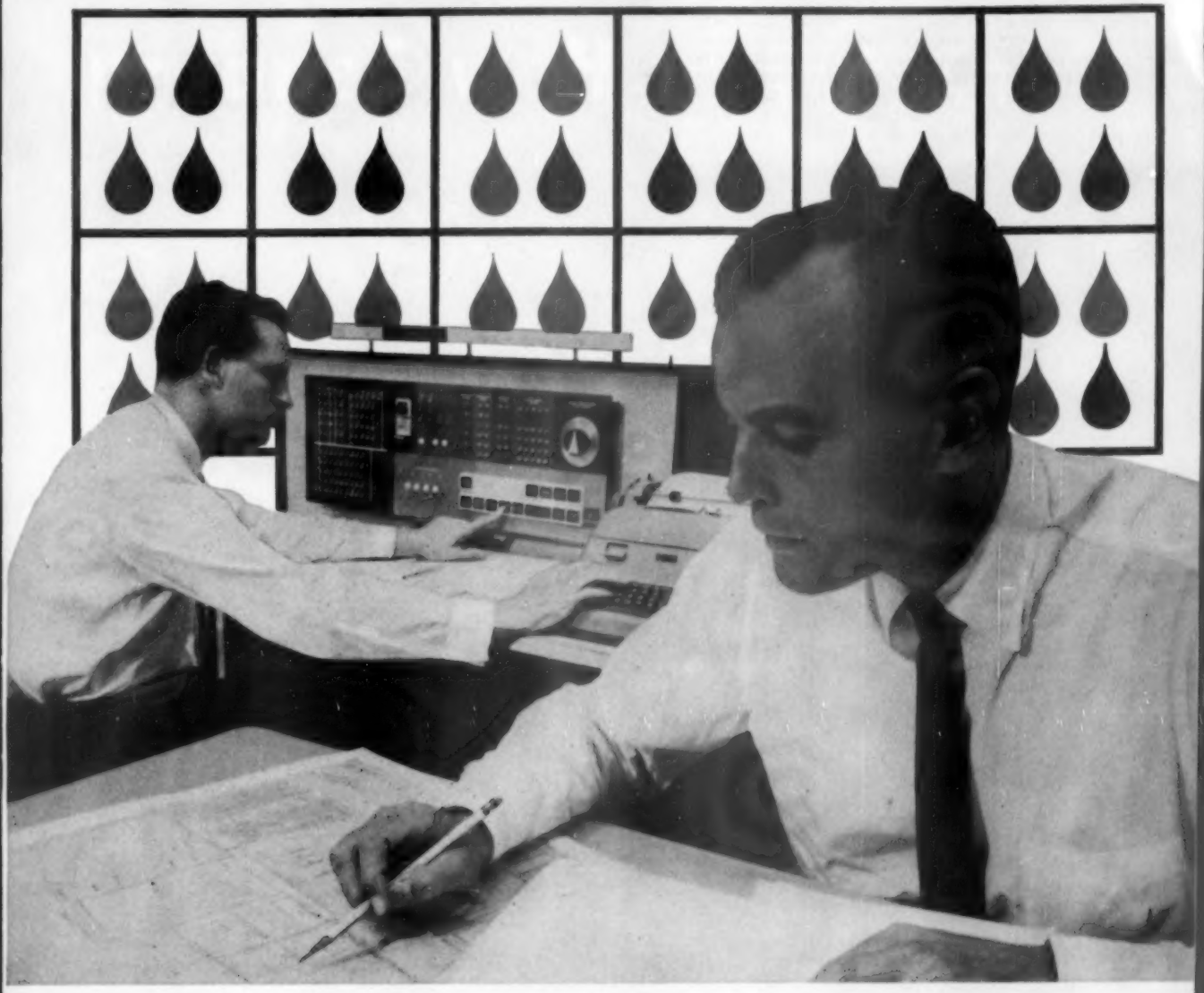
•

Engineering

A mechanical detector of gas in air, which operates without attendance and requires no power and no chemicals, has been developed by Detectogas Instruments, Inc., Houston, Tex.

The "Detectogas Monitor" operates on the principle that even a small concentration of a gas in the atmosphere is enough to change its density. When the instrument detects such a change, an accurately balanced float causes a mercoid switch to operate an alarm circuit.

A change of as little as 1.2% in the density of the air is sufficient to activate the detector, the company says. Thus, the minimum concentration of any gas that can be detected depends on how much its density differs from that of air.



Low-cost IBM 1620 solves gasoline blending problem

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The IBM 1620 prints out a complete description of its optimum solution, giving you the flow rates, unit severity levels and product compositions which should be used for the most profitable operation. Each variable in the system is accounted for, with complete cost ranges to indicate the sensitivity of your system to the initial cost and product data.

Using linear programming techniques, the 1620 adapts efficiently to changes in your system. These techniques will be made available without cost to IBM customers later this year. This is another example of Balanced Data Processing . . . machines supported by complete services. For information about the IBM 1620 and the special advantages it offers for blending and other important petroleum applications, call your local IBM representative. Like all IBM equipment, the 1620 computer may be purchased or leased.

THE IBM 1620 is an economical, desk-size engineering computer with features previously found only in larger systems. It offers solid state design, magnetic core storage and high-speed internal computing performance. Its versatility and ease of operation recommend it for such petroleum industry applications as distillation problems, unit correlations, evaluation of options and determination of equipment efficiency.

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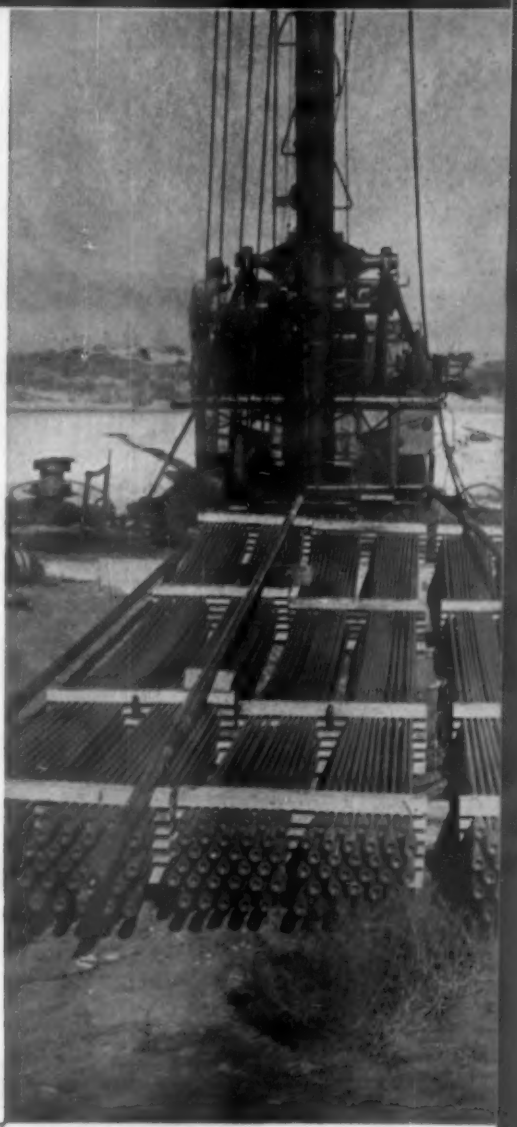

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Crude Truckers Fill Pipeline Gaps

In his dual role of transporter and middleman, the tank trucker is playing an increasingly important part in moving crude from field to refinery.

While pipelines carry the bulk of the country's crude, trucks have recorded steady—if modest—gains over the past decade.

This record is due in large measure to the fact that trucks are the only economical means of moving crude out of areas where reserves are too low to warrant pipelines.

The chief factor contributing to the growth is the existence of numerous fields without pipelines.

Biggest increases in crude truck movements, according to a survey, have occurred in four types of producing areas:

- Recently discovered fields where production develops very rapidly. A prime example of such an area was Green County, Ky., where Ashland Oil & Refining Co. later built its pipeline from the field to Louisville.
- Fields which are remote from existing pipelines, and to which facilities can't be built economically. Many such fields exist in the Rocky Mountain area.
- Older producing areas in which new pools have been discovered, but whose reserves are insufficient to justify the construction of lines. Areas of this kind are common in Illinois, Michigan, and Ohio.
- Areas where terrain and other factors make trucks more economical than pipelines. An example is the Los Angeles area.

FLEETS OF TRUCKS were needed in Green County, Ky., before pipeline was built.

Heightened activity in crude truck traffic appears to be nationwide. One major trucker predicts an overall gain this year of from 3% to 5%.

No figures have been compiled for the U.S. since 1958, but in that year trucks transported 194.6-million bbl. of crude as compared with 97.5-million bbl. a decade ago.

And, in that period, the truckers' share of the crude haulage business grew from 4.37% to 6.45%.

The amount of crude moved by truck from all leases in Texas has increased each year from 1956 to 1960. And the volume hauled by truck is expected to continue to climb.

Movements for a typical month—February—show how traffic has grown.

In February of this year, tank trucks, both privately owned and common carriers, hauled 3,597,675 bbl.—a gain of 1,010,410 bbl. over 1956.

Volumes hauled during February in preceding years were: 3,494,787 bbl. in 1959; 3,173,414 bbl. in 1958; 3,136,347 bbl. in 1957; and 2,587,265 bbl. in 1956.

Today, the trucker who buys and then resells the crude, as well as transports it, is probably the rule rather than the exception.

In fact, one industry source estimates, some 90% of all crude moved by truck in the U.S. is handled through "buy-and-sell" arrangements—as opposed to "contract trucking," in which the oil company takes title at the lease tank and the trucker just delivers the crude.

In most cases, when a carrier purchases the crude for resale, the cost of transportation is borne by the producer.

The "buy-and-sell" deal is popular even when the oil company, through separate affiliates, is both the producer and the receiver of the crude. One reason is that, in such a case, the trucker assumes the burden of the common purchase.

The trucker-purchaser must assume the risk of disposing of the crude he buys, since firm contracts hardly ever exist between him and his outlet.

Arrangements between truckers and oil companies are generally made by telephone, and any contract—if one is written—usually is drawn days after the deal has been consummated, and is only for the record.

By assuming their dual role, truck-

Where Five Major Truckers Haul Crude

(March, 1960, in barrels per day)

	A	B	C	D	E
West Texas	2,802	18,620	19,633	10,389	0
South Texas	19,021	14,663	0	12,434	0
Gulf Coast	24,298	12,911	0	1,981	0
East Texas	24,400	11,307	294	2,453	0
North Texas	11,379	3,114	12,028	2,857	0
Panhandle	0	9,312	0	0	0
Southern La.	20,788	1,249	4,992	3,717	8,109
Northern La.	9,153	0	0	46	2,274
Ala.-Miss.	6,194	7,388	0	123	445
S.E. New Mexico	0	3,709	4,825	4,120	0
N.W. New Mexico	0	0	0	2,026	0
Totals	168,035	82,273	41,772	40,146	10,828

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MARSH

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VALVES

ers have also compounded their operating tasks.

For example, the carrier who also purchases the oil normally handles division orders and disbursements, submits nominations to state regulatory bodies, and deals with royalty owners.

One large trucking firm reports that its monthly rental bill for IBM machines to do its accounting is $2,500.

For the big crude trucking companies, investments are high.

One firm puts the value of its physical assets at $2.8-million.

Of this total, $2-million has been invested in trucks; $500,000 in terminal facilities; and $300,000 in tankage.

Five major haulers reportedly moved a total of 343,054 b/d in March in Texas, Oklahoma, New Mexico, and the Gulf States.

While most of this crude was hauled by truck, part of it was moved in trucker-owned gathering lines.

Daily averages for the companies ranged from 10,828 bbl. to 168,035 bbl. (table).

Two of the five, which also operate in other areas, buy and sell a total of over 3-million bbl. of crude a month.

And at least three more crude truckers in the U.S. are known to handle between 15,000 b/d and 35,000 b/d.

One of the three currently buys crude from more than 1,200 leases in Oklahoma, the Texas Panhandle, Kansas, and Colorado. Over the past five years, the company has serviced a total of about 3,000 leases.

This company's purchases average 17,000 b/d. The crude is delivered to some 40 common-carrier receiving stations. Half of it is moved through the company's own 125-mi. gathering system, and the other half is trucked.

Throughout its operating territory, the company maintains storage facilities with capacity of 300,000 bbl.

In recent months, truck transport charges have dropped.

Sharper competition for available business is given as the main reason.

Secondary causes have been cost-cutting moves, such as adoption of aluminum trailers, which permit use of larger tanks, and also a relaxation of road-weight allowances in some states.

In determining the charge to be made, the two most important factors are length of haul and truck size.

Most truckers calculate their haulage rates from a flat base of 15¢ a bbl., which is the cost of gauging, gravity readings, loading, and unloading. Above the 15¢, the prevalent rate is 1¢ per bbl. per mile.

What's New
IN TRANSPORTATION

Mid-Continent Pipe Line Co. has bought a 30-mi. crude gathering system in Seminole and Pottawatomie Counties, Okla., from Service Pipe Line Co.

The system takes crude from 45 leases, which produce some 500 b/d.

Mid-Continent says the crude will be transported to the Tulsa refinery of DX Sunray Oil Co., its parent company.

•

The request by Tennessee Gas Transmission Co. to import 204-million cf/d of Canadian gas on an interruptible basis at Niagara Falls, N. Y., will be heard Sept. 19 by the Federal Power Commission.

Exporter would be Trans-Canada Pipe Lines, Ltd., from which Midwestern Gas Transmission, TGT's subsidiary, has authority to import 204-million cf/d on a firm basis at Emerson, Manitoba (PW—Dec.30'59, p43).

Trans-Canada has export permits for both amounts.

•

Natural gas started moving last week through the new $196-million pipeline of Transwestern Pipeline Co. from West Texas to California (PW—May20'60,p53).

Initial deliveries to Pacific Lighting Gas Supply Co. were at the rate of 50-million cf/d. Deliveries will be increased first to 100-million cf/d, and then to 300-million cf/d by Oct. 1.

•

Engineering

Gulf Research & Development Co. has built a batch separator on the principle of a pipeline scraper, which it says cuts product commingling by about 70%.

The separator consists of a steel body, with a rubber sphere at the front end and two standard pipeline rubber cups at the back end.

Prior to insertion, the sphere is filled with water to a size one-quarter inch larger than the diameter of the pipeline to assure a tight fit. The cups at the rear act as pistons to push the device ahead.

Gulf says that the separator was tested in the products line of Laurel Pipe Line Co., where it reduced the amount of interface mixture by more than two-thirds.

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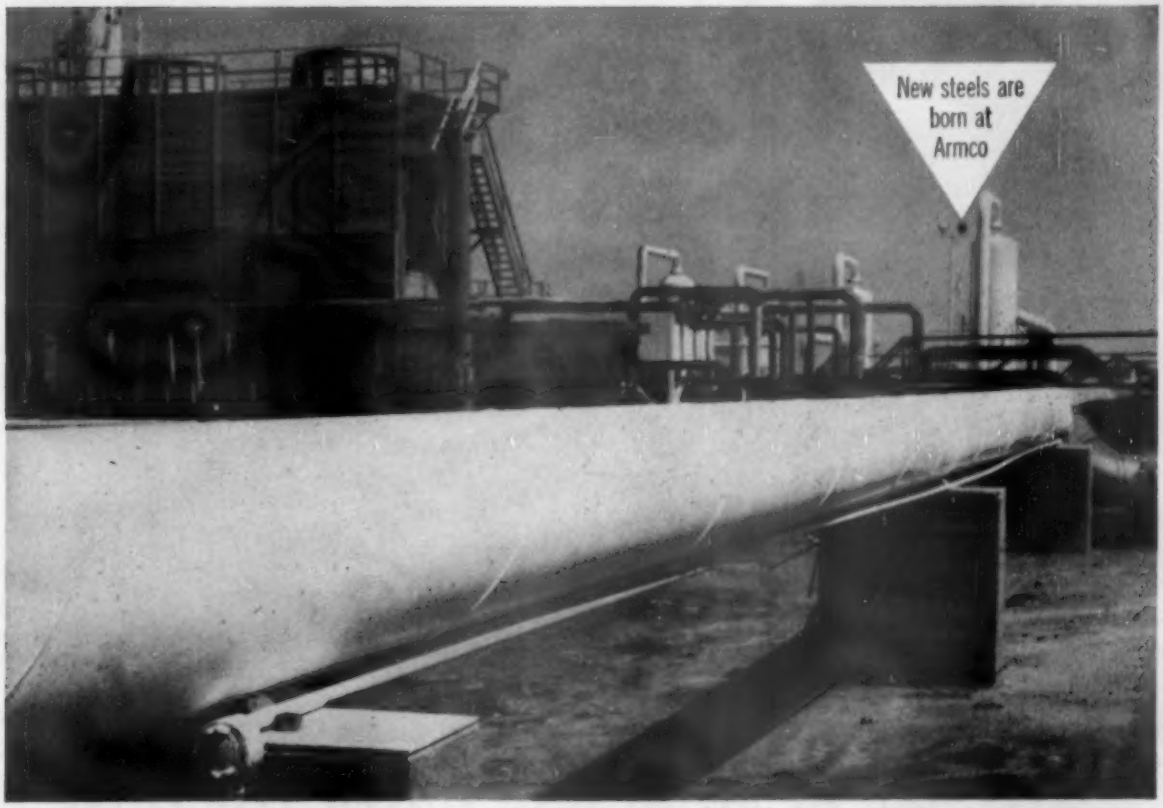
for the strength you want in the sizes you need



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White Plains, New York

Here's Venezuela's Price Resolution . . .

CARACAS—A crucial question in the world oil pricing issue remained unclear this week: Will Venezuela actually bar a cut in its crude price postings?

Oil Minister Juan Perez Alfonzo flatly stated last week, following the cut in the Middle East, that he "will not allow" a reduction in Venezuelan postings (PW—Aug.12'60,p6). When asked if the government will "order" companies to maintain them, he pointed to a resolution approved by the Council of Ministers.

Oil circles are puzzled by an implicit contradiction in the text of the new Venezuelan resolution on the price issue.

While it says sales "should" be made at present published prices, its conclusion states only that the Oil Ministry will shut in production destined for sale at "abnormal discounts."

Oil men point out that Venezuelan discounts are already considerably larger than those in the Middle East. Thus, if Venezuelan postings are not reduced now, even larger discounts would be necessary to keep Venezuelan oil competitive with Middle East crudes in world markets.

The question now: Does the new resolution mean the government will actually bar such discountings? If so, then the only alternative would be to slash postings to actual market levels —a move Perez said he would not allow.

Here's the resolution in full, as drafted by Perez:

"Whereas the National Constitution establishes that the state can dictate measures of an economic nature in order to rationalize and promote the production and regulate the movement and consumption of wealth;

"Whereas the Law of Hydrocarbons establishes the public utility character of everything referring to hydrocarbons, and in Par. 5 of Art. 59 imposes the obligation on concessionaires of carrying out their operations in such a manner that waste of these substances does not occur;

"Whereas the National Executive has established as one of the basic principles of hydrocarbons policy the maintenance of market prices which guarantee an equitable share in this nonrenewable national wealth;

"Whereas sales of hydrocarbons should be effected at present published prices, without discounts in excess of the normal limits in trade;

"Whereas abnormal discounts in sales of hydrocarbons constitute an economic waste which is contrary to the national interest, and could provoke the deterioration of petroleum prices in the international market;

"Therefore: This Ministry will order the suspension of that production which concessionaires destine for sales at abnormal discounts, in the judgment of the Coordinating Commission for Conservation & Marketing of Hydrocarbons, which will make recommendations after analyzing cases."

. . . And How Perez Views World Pricing

CARACAS—The pricing resolution approved by Venezuela's Council of Ministers last week followed an "official declaration" of views on world oil pricing by Oil Minister Juan Perez Alfonzo.

In a preface to this lengthy statement, Perez said he felt the declaration "necessary" in view of what he called a recent "press campaign" on impending cuts in world crude postings. He specifically cited three "Petroleum Comments" articles in the PETROLEUM WEEK issues of July 15, 22, and 29.

Here is the text of his statement, entitled "Are Oil Prices Weakening?"

Maneuvers tending to force down oil prices are constant, because the world's largest nations have a constant interest in buying at the lowest possible prices.

It is only natural that the buyer should try to obtain low prices, while the seller is interested in just the opposite. But in international commerce the so-called terms of trade invariably mean that the more powerful take advantage of those who have less power, especially when the latter do not know how to run their affairs properly and thus are easy prey for deceit, contradictions, and tricks.

Luckily for Venezuela, its oil exports—axis of the economic activities of the nation—were formerly protected by the parallel interest of another large and powerful exporting nation which knew how to defend the prices of such an important product as is the energy that is obtained from hydrocarbons.

As long as the U.S. was contributing oil exports to the international markets, Venezuela and other exporting countries had no trouble defending their prices.

In those days, the problem was limited to maintaining vigilance over the share which should remain for the exporting country; and even so, an adequate and just share of petroleum profits was not always defended.

When the United States stopped selling its oil in the international markets in 1948, the remaining exporting countries were left to defend themselves.

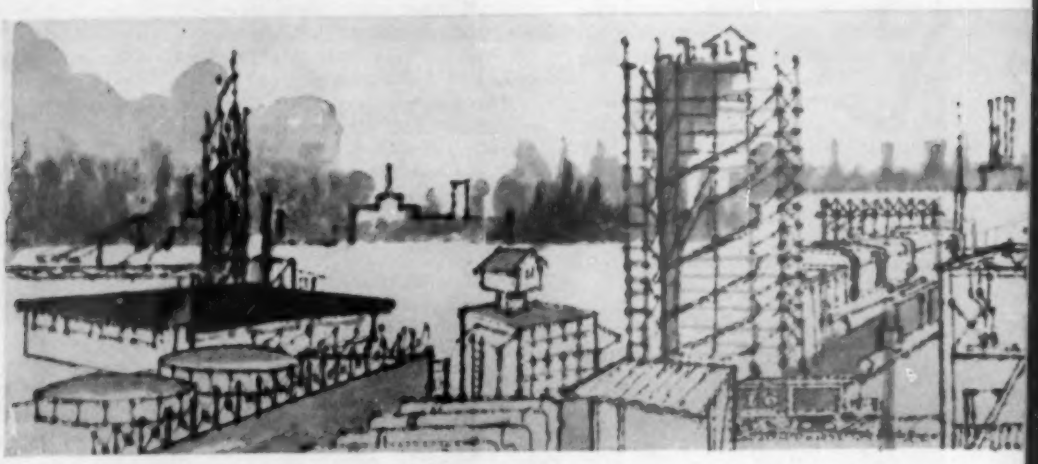
At that time these countries could not, or did not know how to, limit the exaggerated profits of the companies that trade in petroleum. They should have increased the participation of the country which is the owner of the nonrenewable wealth.

That is how the big consumers saw the opportunity of carrying on, for their exclusive benefit, a policy of reducing the exaggerated profits of the companies, which the producing countries should have adjusted themselves.

The Economic Commission for Western Europe made a study of oil prices on these principles in 1953. Since that date, the question of dissociating oil prices in the international market from prices in the U.S. was clearly posed. The object was to break the traditional price structure which was established on the basis of the production costs of the largest producer. Since those costs—which include no value whatsoever for the nonrenewable product—are so low in the exporting countries that they left exaggerated profits for the companies, it was suggested that the prices of the international market should be low-

Continued on page 84

ENGINEERING AT ITS BEST



WHAT YOU SHOULD EXPECT

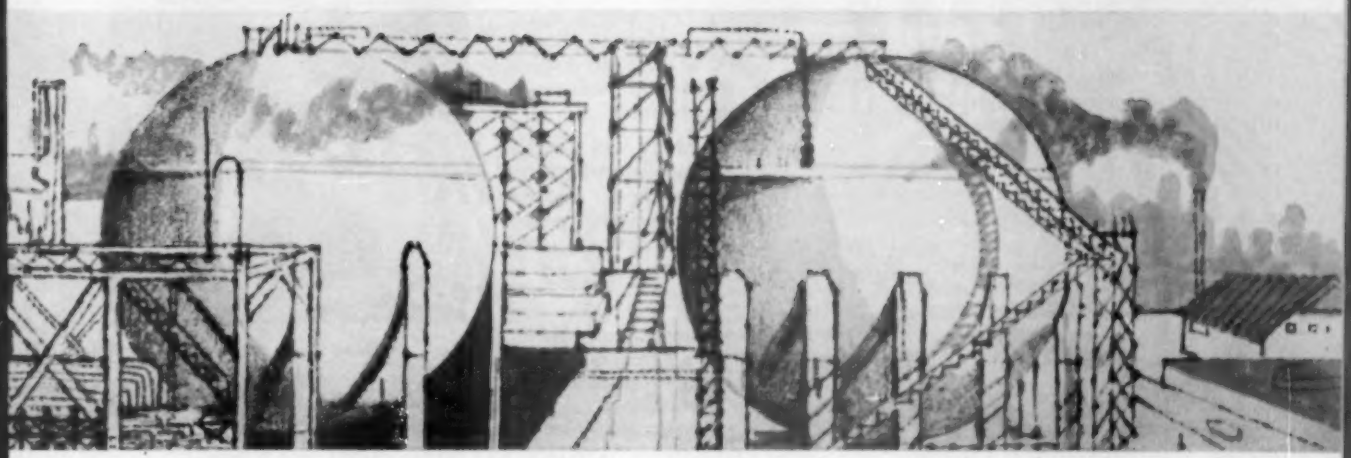
When you go to an engineering firm for help in the design and construction of a new plant, or the expansion of existing facilities, you have a right to expect certain basic standards from that firm. They should have EXPERIENCE, for only with past experience can you minimize the number of new problems which will arise on any new project. Such experience, however, should be tempered with FLEXIBILITY, CREATIVITY and VISION. Some companies are experienced beyond measure at building plants from designs more than 25 years old. In the highly competitive years ahead, such plants could prove economically unsound. You owe it to your company's future to select a firm which has proven its ability to provide the newest and the best in process engineering.

For almost half a century, CHEMICO has maintained a reputation for progressive and imaginative process design and improvement. This proven "know-how" is available to firms in the chemical and petrochemical fields requiring any and all types of engineering and construction services.

WAYS OF WORKING WITH THE CLIENT

A recently completed petrochemical plant offers the best example of the several ways in which CHEMICO is prepared to work with its clients. This huge complex was designed to produce acetylene derivatives, and included processes for producing a wide range of basic chemicals. The ammonia, sulfuric acid and ammonium sulfate sections of this plant were based on *Chemico's own proprietary processes.* The designs for the acrylonitrile and hydrogen cyanide units were based on processes developed in the *client's own pilot plant.* For the acetylene plant, CHEMICO *obtained a license* from BASF in Germany for their patented production-proven process. The oxygen plant was designed by the Linde Company of Germany on a *sub-contract basis.* CHEMICO's Construction Department was responsible for erection of all the plants, and CHEMICO's Industrial Projects Department supervised, coordinated and controlled the entire project.

CHEMICO is always prepared to provide its services to clients on any or all of the bases indicated above. For clients with processes of their own, CHEMICO's Industrial Projects Department will engineer and construct plants, starting at any stage of development. CHEMICO's own laboratories and pilot plant are available, if desired, for process development and improvement work on a contract research basis. If the process to be employed has already undergone pilot stage testing, CHEMICO will design the most economic and efficient commercial scale operation. In such a case, the client can be sure that CHEMICO will call on the services of outstanding engineers and technical personnel with experience similar, or related to the unit operations which are to be designed, engineered and constructed. In addition, the client can be assured that CHEMICO, as an independent engineering organization, will undertake such activities in the framework of a completely confidential relationship,



with all necessary safeguards for protecting the client's competitive position in regard to trade secrets and research developments.

In the case of clients who want plants to produce products for which neither CHEMICO nor the client has a process, CHEMICO, through its Industrial Projects Department, will obtain licenses from whatever source possible for production-proven process designs which will enable the engineering and construction of the desired plant.

Very often CHEMICO's drafting force as well as its specialists in civil engineering, mechanical engineering, electrical engineering and other service engineering capacities can be made available to clients on an individual contract basis. CHEMICO's construction organization, made up of a permanent force of highly experienced construction superintendents, is prepared to undertake a wide range of erection projects related to the process industries.

CONTRACT ARRANGEMENTS

CHEMICO offers its clients a wide choice in the type of contract under which each individual project is to be handled. Among the more common arrangements—although by no means the only ones available—are the following:

Cost Plus Fixed Fee: Under this type of contract, CHEMICO's fee and overhead charge for engineering, construction and related services is decided by mutual agreement, and the client is billed at direct cost for any and all expenses incurred by CHEMICO to complete the client's project.

Lump Sum: At the client's request, CHEMICO submits a firm estimate containing a specific price for which CHEMICO will undertake to complete the client's project.

Guaranteed Maximum: Under this type of contract, CHEMICO will set a maximum cost to the client for an individual project. If the cost of the project falls below the maximum figure, all savings will be divided between CHEMICO and the client on the basis of a prearranged rate.

Fixed Price Equipment Supply: Under this type of contract, the client gets the benefit of CHEMICO's design, engineering, purchasing and expediting services, but is free to make his own arrangements for the construction of his project.

Basic Design and Construction Supervision: This type of arrangement has proved extremely useful in dealing with clients outside the United States. Ordinarily, under a contract of this sort, CHEMICO provides the basic engineering for a project, and the client makes other arrangements for the detailed drawings and construction. CHEMICO then supervises construction and sees the project through start-up operations.

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". . . Venezuela should not let itself be drawn into a price war. It is preferable to diminish sales . . ."

PEREZ statement starts on page 81

Juan Perez Alfonzo

ered in favor of the consumer countries.

When Venezuela became free of its dictatorial government, it defended its petroleum wealth by raising taxes to adjust its share in the profits of the oil industry. But the tendency to break the price structure was already gathering momentum, and the Middle East still has not been able to adopt the necessary measures of common defense required by the circumstances.

The memorandum which Venezuela forwarded to the British government in May, 1959, mentioned that upon reopening the Suez Canal in May, 1957, "the uniform increase of 13¢ per barrel for the entire oil production of British Petroleum Co. represented less than half the increases obtained in America by crude producers during the supply crisis of Europe."

That was the first step toward the separation of prices in the international market. The second step, a decisive one, was the new reduction on February 12, 1959, of 18¢ which British Petroleum posted, bringing prices 5¢ "below the level maintained before the Suez crisis," as stated in the memorandum.

It was pretended at that time that the level of oil prices, which was the lowest since 1953, would hold firm after having eliminated the discount that exporting companies had been granting.

The pressures and maneuvers of the large consumer countries still continue. They take advantage of the so-called excess potential production —created mainly to supply the markets of the big consumers of Western Europe during the Suez crisis—and also the multiplication of new producing companies which accidentally or of necessity serve as shock troops to breach the defense of prices.

The tactic of taking unfair advantage of the underdeveloped countries in the purchase of their products is now being tried in the oil market. Under the mask of free competition and the necessity of defending markets, the large consumer countries—which also exert the greatest influence on companies that deal in petroleum, since they provide the industry's capital—have been obtaining discounts here and there to weaken more and more the prices of the articles they need. The plot is aided by utilizing the press and other international means of communication which are also controlled or influenced by the consuming countries. . .

International strategy took advantage of the latest movements of the Soviet Union in foreign oil markets as a magnificent opportunity to use the contender as justification for unleashing a price war.

These retarded strategists think that it is still easy to deceive the underdeveloped countries, and that in the confusion of the economic cold war, the Soviet Union can be blamed for the price reduction they are seeking. The USSR is consciously or unconsciously serving the interests of the large consumer countries by directing and applying its tactic of upsetting the balance of the international oil market, pretending to attack the old oil cartel that used to serve as an instrument of the superdeveloped countries.

At present the situation is different, and the oil producing centers know it. The superdeveloped countries will sacrifice the companies that previously served them well on the altar of the greater benefits which they can now get by separation of oil prices in the international market. Once separated, prices can be more easily attacked and brought down to a minimum for the benefit of consumer countries. In this game of taking advantage of the opponent's tactics, who will be the final winner?

Apparently the Soviet Union is serving as an instrument with its sales and barter of oil, which count very little in the volume of international trade, but which are very well utilized to unsettle prices. In a way, the Soviet Union could be blamed for playing the large consumers' game.

But this will not be the tactic of the Russians, knowing that when it is understood who receives the greatest benefits, the real responsibility will fall on them (i.e. the consuming countries).

London reports mention that there exists the greatest concern for maintaining the best relations with the exporting countries of the Middle East since Great Britain has a vital interest in maintaining the stability of that region. It is emphasized that Britain, like the producing companies, is "anxious to maintain relations with the governments on the best possible terms." From this one gathers that the U.K. is "on the side of the producing nations, rather than with the consumer areas such as Germany, Italy, and Sweden, which would benefit from a reduction of prices."

But the truth is that the U.K. is the biggest consumer in Western Europe, and the U.S. is now the biggest consumer of imported oil in the world. The reduction of prices, as we said before, favors most those who consume most. Thus, in the U.S. as in Great Britain, interests at stake in the oil prices are most important.

These two countries also happen to be the ones with the largest investments in the companies which produce and sell the oil in international markets.

Therefore, the governments of these two nations are most responsible for whatever may happen to oil prices.

The system of import licenses established by the U.S., as stated repeatedly, allows an unfair advantage in the profits obtained by refineries at the expense of the crude shipped by producing countries. The trading at a profit in licenses granted to refineries that do not use imported oil has been repeatedly analyzed in the U.S. itself as a gratuitous way of making money, but authorized by the system of licenses.

The system of quotas by country, which Venezuela has urged, would preserve the benefits for the producing countries, and would also have been effective in curing the ills of the

Continued on page 86

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RIDGID 535 Quick-Opening Die Head, shown here, threads ¼" to 2" pipe with just 2 sets of dies . . . adjusts to size right in machine . . . no fumbling for right size threader . . . no slow back-off. All other RIDGID Machine Pipe and Bolt Die Heads can be used. Add a RIDGID No. 19 Nipple Chuck, and you can thread close nipples.

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U.S. industry—which has not been achieved by the system of licenses. But instead of studying a fair system for the producing countries, the failure of the license system has resulted in thinking about the adoption of tariffs to increase the profits of the oil importing country.

Great Britain, with the price reductions obtained in 1959, paid only 8% more for its 17% consumption increase in that year, or less than half the increase.

The situation as it affects the Middle East is even more dramatic. The increase in oil imports from that region reached almost 12% while payments increased only 1.5%.

The situation may be considered as the same for Italy, France, Germany, Holland, or Sweden—all big consumers. The benefits they obtain from lowering of prices can be counted in millions and millions in exchange which the producing countries cease to earn.

But the producing countries are now much more conscious of their position, which is therefore stronger. As a result, it can be expected that the unjustified attempts of the large consumers will not be successful. But if they should happen to win the price battle, their triumph in the end will not endure.

Venezuela knows very well that important goals are not easily achieved. Its struggle to achieve a democratic system of government has proven that justice wins in the long run. But it will be necessary to make great collective and individual sacrifices.

A situation of social and economic readjustment such as that faced right now by Venezuela demands of all sectors the greatest effort and the best mental attitude on the domestic front, putting aside all defeatist attitudes and rejecting the easy solutions of a policy of big expenditures for non-reproductive projects.

On the international front, Venezuela faces a long and hard struggle on oil questions—together with other countries which are in the first stage of development acceleration—and with those called underdeveloped, in primitive or transitional stages.

Here also it will not be easy to reach the objectives indicated by the national interest, but eventually the struggle will end in success. The large consumer countries, whose prosperity and high standards of living have been obtained in good part at the expense of the little countries and their low living standards, will bear much of the blame and responsibility for the adverse effects which their mistaken economic tactics may have in the development and welfare of the world.

Conclusions

(1) Venezuela should not allow itself to be drawn into a price war. It is preferable that it reduce sales rather than maintain income by wasting oil, which is a nonrenewable resource.

(2) The convenience of diversifying the supply sources of such a fundamental product as oil gives Venezuela an advantage because of its geographic position, which should be utilized.

(3) The new sources of oil such as the Sahara, Libya, and the supplies available from the Soviet Union—so overworked by the international press—do not have the relative importance attributed to them, and the constant increase in world demand should permit their placement without disturbing either markets or prices.

(4) The Middle East, great center of world oil reserves and of production for international commerce, is well aware of what is convenient for its fundamental interests and of the responsibility which it has in the world market.

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What's New / AROUND THE WORLD

KUWAIT—Commercial production facilities are being planned for the "significant" Minagish discovery made in South Kuwait last year, according to Kuwait Oil Co.

The company says drilling to define the limits of the field, 21 mi. west of Burgan, is continuing.

•

UNITED KINGDOM — France's largest oil company plans to move into gasoline retailing in Britain as part of current moves to expand its foreign market outlets.

A London spokesman said Cie. Francaise des Petroles will probably supply gasoline from its French refineries to Total Oil Products, an affiliate already established in Britain.

•

PERU—Cities Service and Richfield have announced the underwater completion of their latest offshore Peruvian well.

The well, completed under 132 ft. of water, tested at 200 b/d on choke, with the oil flowing through 6,200 ft. of 3-in. submarine line to storage facilities on shore.

•

TURKEY—Mobil's new Turkish discovery has an indicated yield of 1,200 b/d, five times as high as originally announced last month, Mobil reported last week (PW—Jul.29 '60,p40).

After treatment, the No. 1 Bulgurdag flowed 38.9-gravity, low-sulfur crude without water through 3/8-in. choke at the higher test rate. The well is the biggest discovery in Turkey to date.

•

ARGENTINA—Italy's ENI group has signed a supplementary contract to drill a second 300 wells in Comodoro Rivadavia for YPF, Argentina's state oil agency, with an option for 600 more. Terms were not disclosed, though YPF was negotiating for seven-year payment (PW—Jul.8'60,p82).

•

CUBA—Egypt reportedly will supply gasoline to Cuba, supplementing the Castro government's imports of Soviet oil. The semiofficial Middle East News Agency said the Cairo government has agreed to export 10,000 to 16,000 tons of gasoline monthly. Reports in Mexico City last week, however, indicated that Cuba currently has a surplus of gasoline, due to higher yields from Soviet crude and to a drop in demand.

•

PAKISTAN — The Soviet Union's offer to help Pakistan in oil exploration has been accepted. A group of Soviet experts is expected to arrive shortly for a preliminary study, the Pakistan government announced.

•

LEBANON—A site east of Sidon is being selected for a second wildcat by Cie. Libanaise des Petroles, 50% owned by Gewerkschaft Elwerath, expanding West German producer. Its No. 1 El-Kaa is now below 4,920 ft. in the northern Bekaa Valley.

•

Total world refining capacity was boosted 8% last year to 23.4-million b/d, according to the Petroleum Information Bureau, of London.

Gains of about 14% were made by British and associated Dutch companies, and also by the Soviet bloc. Their totals at the end of 1959 were 3.6-million b/d and 2.9-million b/d respectively. U. S. companies, with the biggest single share, gained only 6% to 13.3-million b/d.

•

LIBYA—Sinclair has incorporated a Libyan affiliate, Sinclair Libyan Oil Co., in Delaware, as the first step toward a possible move into the oil play, though it has no immediate plans to bid.

•

LIBYA—Four new members have been appointed to the Libyan Petroleum Commission by royal decree: Mohammed Saifat, chairman; Abu Bakr Izmirli; Salim Saif Nasr; and Husain Bal-Aun. The decree also accepted the resignations from the commission of Ani Qasem and Tahir Bashti.

Memo from GULFCO !

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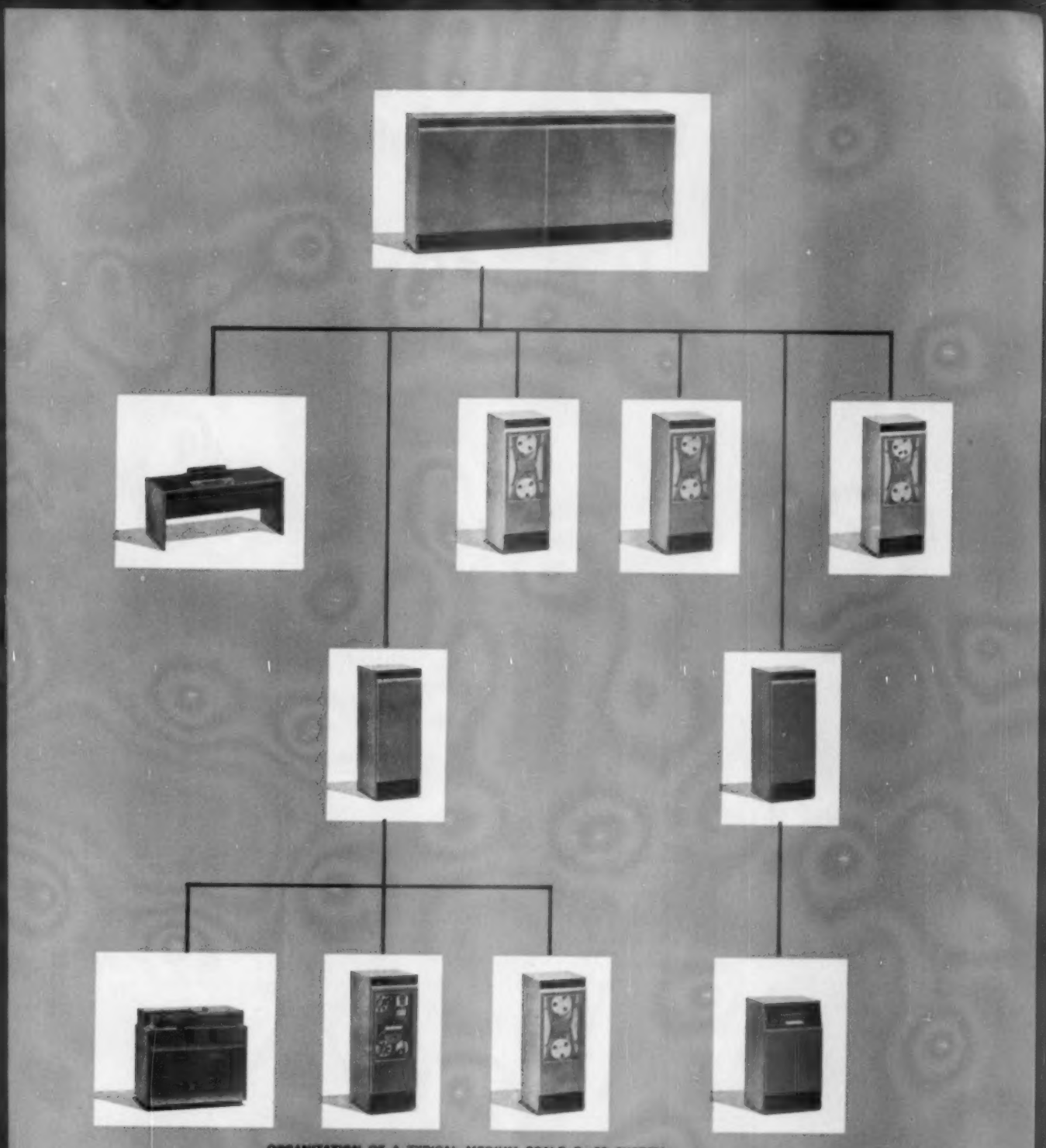

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A leading international pipeline company recently wrapped over 100 miles of crude oil gathering and transmission line with Polyken No. 960 Extra-Strength Pipeline Roll.

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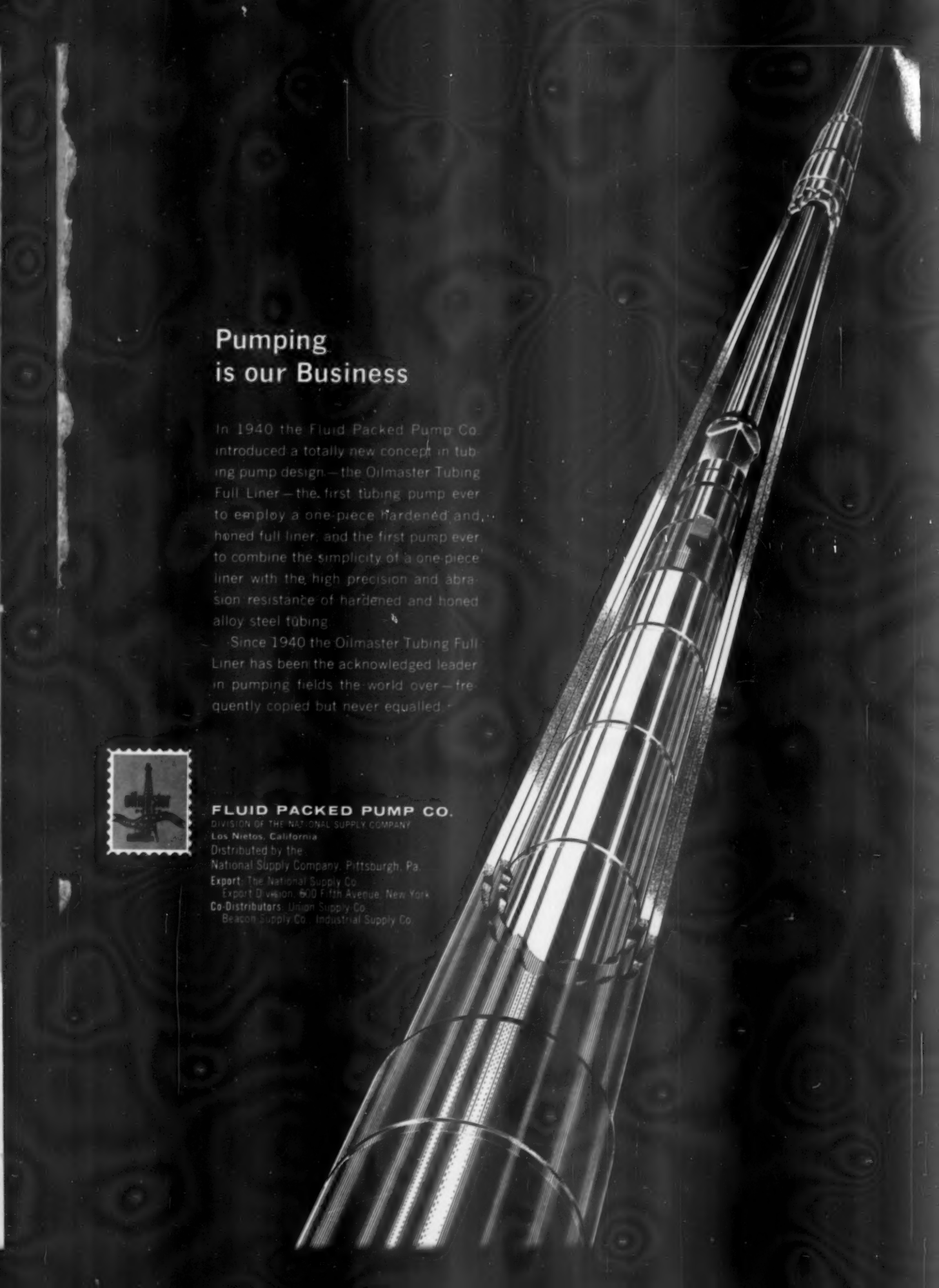
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stam·i·na vigor; capacity for enduring
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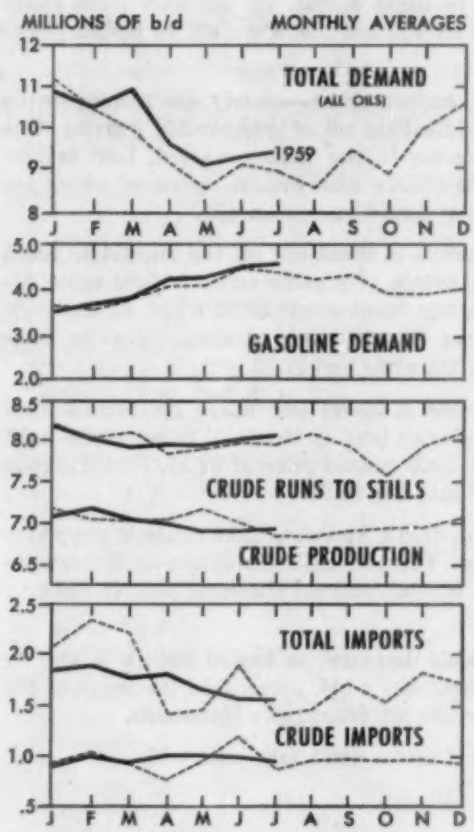
PETROLEUM WEEK'S

Fingertip Figures



Figures for period ended August 12, except as noted

TOTAL DEMAND

Latest 4-week average	8.335
Year ago	8.636

GASOLINE DEMAND

Latest 4-week average	4.488
Year ago	4.462

RUNS TO STILLS

Latest week	8.335
Previous week	8.264
Year ago	7.990

CRUDE PRODUCTION

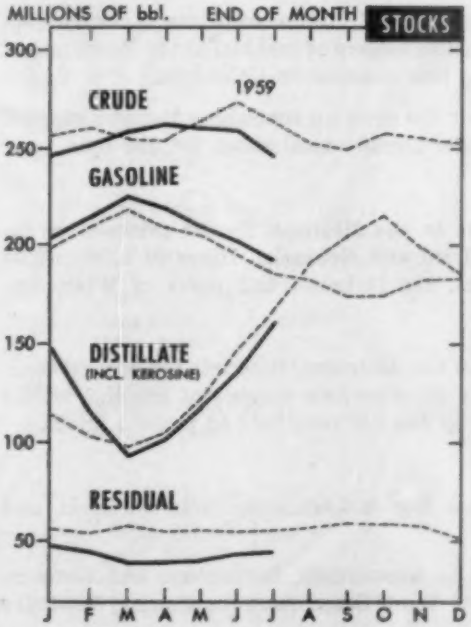
Latest week	6.834
Previous week	6.837
Year ago	6.823

TOTAL IMPORTS

Latest week	1.763
Previous week	1.808
Year ago	1.363

CRUDE IMPORTS

Latest week	1.196
Previous week	.688
Year ago	.942



CRUDE STOCKS

Week-ended Aug. 5	241.2
Previous week	242.8
Year ago	261.5

GASOLINE

Latest week	191.8
Previous week	193.6
Year ago	183.1

DISTILLATES

Latest week	171.9
Previous week	164.8
Year ago	177.4

RESIDUAL

Latest week	44.0
Previous week	43.0
Year ago	55.8

Barring a miracle, refiners will need a Noah's Ark and then some to save themselves from being washed away in a flood of their own products.

Refinery runs jumped 81,000 b/d last week to 8,335,000 b/d. This is just 61,000 b/d short of the all-time high rate of 8,396,000 b/d set the week of Jan. 8, in the height of the season of peak winter demand.

Earlier, the Bureau of Mines had estimated that the "adequate" level for runs during the third quarter would be 8,105,000 b/d. Runs in July averaged 8,260,000 b/d, which, the Bureau said, would require cutting runs in August to 8,100,000 b/d, and to 7,950,000 b/d in September if that level is to be maintained.

So far, crude processed through refineries is overshooting the August desirable level as established by the bureau by some 195,000 b/d.

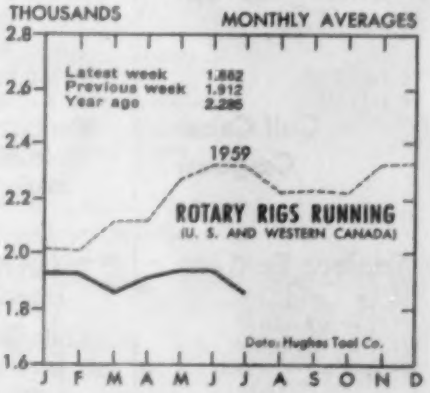
The outlook for products inventories gets blacker by the minute.

Stocks of motor fuel fell by only 1.8-million bbl. last week, after a contraseasonal increase of 452,000 bbl. the previous week. They are now at 191.8-million bbl., or 17.3-million bbl. above the industry's so-called desired levels.

Stocks of distillates made the largest increase of the slow-demand season—more than 7.5-million bbl.—to 171.9-million bbl.

Demand for distillates is holding up well for this time of year. But it may be an artificial demand, bringing a reduced volume of buying later on in the season. If buyers are building their stocks now in advance of higher prices, there's more trouble brewing ahead.

Inventories of crude fell to a new postwar low of 241.2-million bbl. last week, down 1.6-million bbl. from the record low set a week earlier.



The Market Trend

Ship Rates Undercut Venezuelan Oil Prices

If the Venezuelan government can talk the oil companies out of cutting crude prices there, it will be quite a feat. Oil Minister Juan Perez Alfonzo has gone on record that he will not tolerate a cut in posted prices for Venezuelan crudes.

For Venezuelan crudes—at posted prices—simply can't compete up and down the Atlantic with Middle East oil of comparable gravity. The demon of the piece is the depression in the tanker market. Low freight rates give immense advantage to Middle East crudes—some of which are priced nearly $1.00 a bbl. cheaper than Venezuelan oils.

Middle-gravity Venezuelan crude is about 83¢ off the market to reach European destinations. At posted prices, plus going ocean freight rates, 31-gravity Tia Juana on a 4,300-mi. trip lands about $2.95 a bbl. at Antwerp, Bordeaux, London, and Rotterdam. Kuwait crude of similar gravity lands at these same ports (about 6,500 mi. away) at $2.12.

For Canada, Venezuelan crude is about 60¢ above its Middle East competition. Lake Maracaibo crude can land in Montreal today (2,885 mi.) at $2.81 a bbl., assuming the full f.o.b. posted price of $2.55. Kuwait crude can land in the same port (8,385 mi.) for $2.21.

And in Venezuela's backyard, South America, Lake crude is anywhere from 71¢ to 77¢ over the market. You can land Tia Juana in Montevideo (4,645 mi.) for about $2.98 a bbl. Kuwait reaches the same port (8,750 mi.) for about $2.21.

Even Trinidad, on Venezuela's doorstep, is locked out on a strictly money basis. The difference is about 40¢ a bbl. there. And the irony of the situation is that Trinidad is only 550 mi. from Lake Maracaibo.

The outlook for Venezuela: If prices don't fall, sales will.

Heavy Fuel Off In Middle East:

The puzzler last week was the drop in "C" fuel cargo prices in the Persian Gulf. The Japanese have been active buyers of residual in the Persian Gulf —ever since supplies dried up this summer in California.

So the question is asked: Why cut the price on something in tight supply? Japanese inquiries for September already total about 100,000 tons.

Midwest 'Gas' Up:

Gasoline price advances continue in the Midwest. Dealer prices were increased last week by 0.5¢ in Iowa and Nebraska. Hikes of 0.2¢ to 0.5¢ also were posted in Minnesota, the Dakotas, and parts of Wisconsin.

Gulf Coast Cargoes:

The Gulf Coast cargo market is in the doldrums. Products for prompt loading continue well held. But the three or four cargoes of gasoline on the market now could be 15 or 20 by fall—if runs hold at present levels.

Tapioca Tankers:

The grain trade is taking quite a few tankers away from oil hauls, and rates are stiffening.

Grain rates from the U.S. Gulf to Amsterdam, Rotterdam, and Antwerp have risen 50¢ to $4.25 a ton. West Coast rates to Bombay now are running around $6.60.

The Market Place AROUND THE WORLD

Prices compiled for PETROLEUM WEEK by Platt's OILGRAM Price Service and National Petroleum News, McGraw-Hill Publications

All prices as of August 15

Bold face type indicates changes from previous week

KEY PRICES—REFINED PRODUCTS

(¢ per gal. except dollars per bbl. where $ is shown)

Western Hemisphere

U.S. Gulf Coast, cargoes
- Gasoline, 98 oct prem....12.25-13.25
- Gasoline, 92 oct reg....11.25-11.5
- Kerosine....9-10
- Heating oil, No. 2....8.25-9
- Gas oil, 48-52, d.i....8.5-8.875
- Fuel oil, bunker "C"....$2.30

Caribbean, cargoes
- Avgas, Grade 100/130....14.75
- Gasoline, 93 oct research prem....11
- Gasoline, 87 oct research reg....10.125
- Gasoline, 80 oct research....9.375
- Gasoline, 70-72 oct motor method....9.25
- Kerosine....9.25
- Heating oil, No. 2....8.125
- Gas oil, 48-52 d.i....8.375
- Fuel oil, bunker "C"....$2.00

New York Harbor, barges
- Kerosine....9.8-10.3
- Heating oil, No. 2....8.8-9.3
- Fuel oil, No. 6....$2.62

Okla.-Group 3, northern shpt., bulk
- Gasoline, 91 oct reg....12.5-13.25
- **Kerosine....9.875-10.5†**
- **Heating oil, No. 2....8.5-9.25†**
- Fuel oil, No. 6....$1.80-1.90

Chicago, bulk
- Gasoline, 91 oct reg....12.5
- **Heating oil, No. 2....9.5†-10.35**
- Fuel oil, No. 6 high sulfur....7.65

Los Angeles, rack
- Gasoline, 88 oct reg....11-12.65
- Diesel fuel, PS 200....7.75-11.25
- Light fuel, PS 300....$2.80
- Heavy fuel, PS 400....$1.95-2.35

Natural Gasoline, Grade 26-70
- FOB Group 3....4.5
- FOB Breckenridge, Tex....4

LP-Gas
- Propane, Oklahoma (Group 3)....3.5-4
- Propane, Baton Rouge....4.625

Pennsylvania Lubes
- Bright stock, 25 p.t....25
- 200 vis. neutral, 25 p.t....27

Mid-Continent Lubes, Tulsa basis
- Bright stock, solvent, 95 v.i....26-27
- Neutral, solvent, 200-210 vis....23-24

Gulf Coast Lubes
- Bright stock, solvent, 95 v.i....26
- Neutral, solvent, 200 vis....23

Eastern Hemisphere

Singapore (Pulau Bukom) cargoes
- Avgas, grade 100/130....15.875
- Gasoline, 79 oct research....9.75
- Kerosine....10.125
- Gas oil, 48 d.i. minimum....9.5

KEY PRICES—CRUDE OIL

(2¢ differential per deg. of grav. applies except as noted)

Western Hemisphere

United States (at the well)
- Mid-Continent, (Okla.-Kan.), 36.0-36.9....$2.62-2.97
- North Dakota, 36.0-36.9....2.47-2.87
- Texas:
  - Gulf Coast, low cold test, 26.0-26.9....3.50
  - Gulf Coast, Upper & Lower, 26.0-26.9....2.92-3.22
  - West Texas, sweet, 36.0-36.9....3.00
  - West Texas, N.M., inter., 36.0-36.9....2.93
  - West Texas, N.M., sour, 32.0-32.9....2.71
  - East Texas, flat....3.05-3.25
  - Mirando, 28.0-28.9....2.96-3.31
- Illinois Basin, flat....2.85-3.00
- Pennsylvania Grade, Bradford dist., flat....4.80
- California, Signal Hill, 21.0-21.9....2.32
- North Louisiana-Arkansas, 36.0-36.9....2.72-3.02
- Wyoming, sweet, 36.0-36.9....2.85-2.90
- Wyoming, sour, 32.0-32.9....2.63-2.71

Canada (flat prices, at the well)
- Pembina (Alta.)....$2.38
- Leduc-Woodbend (Alta.)....2.53
- Redwater (Alta.)....2.42
- Steelman A (Sask.)....2.44
- Virden (Man.)....2.30

Venezuela (Cargoes, FOB lifting port designated)
- San Joaquin, 41.0-41.9, Puerto la Cruz....$3.10
- Oficina, 35.0-35.9, Puerto la Cruz....2.78-2.80
- Tia Juana, Medium, 26.0-26.9, Amuay....2.30
- Bachaquero, flat La Salina....1.85
- Tarra, 38.0-38.9, San Lorenzo....2.83
- Lagunillas Heavy, flat, La Salina....2.07

†Differential per deg. of grav. varies

Eastern Hemisphere

Middle East, Persian Gulf (Cargoes, FOB lifting port)
- **Arabia, 34.0-34.9, Ras Tanura....$1.76↓-1.90**
- **Safaniya, 27.0-27.9, Ras Tanura....1.46↓-1.50**
- **Iran, 34.0-34.9, Bandar Mashur....1.74↓-1.86**
- **Iran, 34.0-34.9, Abadan....1.69↓-1.81**
- **Iraq, 35.0-35.9, Fao....1.68↓-1.80**
- **Kuwait, 31.0-31.9, Mina-al-Ahmadi....1.58↓-1.67**
- **Qatar, 41.0-41.9, Umm Said....1.91↓-2.05**
- Neutral Zone, Burghan, 23.5-24.4, Mina Saud....1.51
- N. Zone, Eocene-Ratawi, 20.5-21.4, Mina Saud..1.38

Middle East, Eastern Mediterranean
- **Arabia, 34.0-34.9, Sidon....$2.13↓-2.27**
- **Iraq, 36.0-36.9, Tripoli, Banias....2.17↓-2.31**

North Africa, Phillipeville, Algeria
- Hassi Messaoud, 48 and above....$2.77

KEY TANKER RATES

(Last paid, per long ton, single voyage)

U.S. Gulf-New York, clean....(USMC+17½%) $3.35
U.S. Gulf-New York, dirty (USMC—7½%) $2.64↑
NWI-USNH, dirty....(USMC—60%) $1.10↓
NWI-UK/Cont., dirty....(Scale—52½) 15/7*
Persian Gulf-UK/Cont., dirty....(Scale—65%) 23/5*
Persian Gulf-USNH, dirty....(USMC—70%) $3.81

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These are the Nalco people in the background* when a Nalco Representative tackles your water treatment problem. He can call on any or all of them when necessary ... and the specialized skills and experience they have are strong support for his own expert knowledge of water treatment chemicals—and how plants should use them.

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Low taxes in Missouri . . .

A Boon to Some, A Headache to Most

Low taxes—gasoline, cigarette, liquor, city, state, and federal—have become one of the most important factors in gasoline marketing for many Missouri service station dealers.

A survey by PETROLEUM WEEK shows that dealers who market just inside the borders of the state enjoy a unique advantage over their out-of-state neighbors: Missouri has the lowest gasoline tax in the nation—7¢, including 4¢ federal tax.

But gasoline taxes aren't the only advantage that well-placed Missouri dealers enjoy. Taxes on cigarettes and liquor in Missouri are so comparatively low that motorists willingly cross state lines to shop for these items.

How can dealers in neighboring states compete? An assistant sales manager in a major oil company notes that out-of-state dealers are often forced to accept lowered profit margins in order to price down to Missouri levels. Even suppliers are affected. They often must extend price assistance to dealers who lose gallonage to competing dealers across the Missouri state line.

In Joplin, Mo., for example, a typical border town in the southwestern corner of the state, dealers draw tax-conscious motorists from Kansas, Oklahoma, and Arkansas.

More than 4,000 vehicles on the Oklahoma turnpike bring such motorists from as far as Oklahoma City.

"Yes, I would say that most of my customers wait until they get to Missouri to fill up," comments one dealer who draws motorists from Oklahoma and Arkansas.

Along the northern border, Missouri dealers are often able to post prices that are three cents below their competitors in Iowa.

In fact, one dealer in Hopkins, Mo., recently told PETROLEUM WEEK, "I don't know of any place along the line up here where the price in Iowa is not 3¢—or more—higher."

Meanwhile, a survey of prices in Nebraska border towns shows that Missouri dealers enjoy an even better competitive position in the northwest.

Prices of regular gasoline in the Nebraska towns were 4¢ higher than those posted on the other side of the Missouri River.

Arkansas has formed a buffer zone just inside its borders to protect its retailers against low taxes in Missouri and other states. Dealers located in this 300-ft. zone don't have to pay any more taxes than their competitors just across the state line.

The formulation of these "buffer" laws has prevented the loss of considerable gasoline volume that ordinarily would have been siphoned into Missouri. On the other hand, the buffer laws have pulled an unusual amount of demand into the northern fringe of the state. One marketer estimates that, according to state records, 25% of the gasoline marketed in the bordering Arkansas counties is sold at Missouri tax rate."

Along the Mississippi River, on Missouri's eastern border, dealers are largely insulated from the effects of tax differences.

Bridge tolls and travel time often discourage motorists from crossing the river to tank up with gasoline that may be only 2¢ a gal. cheaper than at their own neighborhood stations.

Only those motorists who work in Missouri and reside on the eastern side of the Mississippi are looked to by Missouri dealers as bringing in a consistent out-of-state demand.

The artificial price boundaries created by varying tax rates have perhaps become more pronounced within Missouri than along its borders. In certain sections, varying municipal taxes have turned the state into a "crazy quilt" of price zones. Missouri is one of only two or three states that permit gasoline taxes to be levied by local governments.

Unfortunately, these local governments have taken undue advantage of the privilege. To one observer, it seems that "every time a new community decides to incorporate, the first law passed is a gasoline tax."

Just as differences between prices across state boundaries have set off price wars, so variations in prices from one municipality to the next have undermined price stability.

Before long, Missouri legislators may agree on a solution to the varying tax problem. But it may mean higher gasoline taxes for Missouri dealers throughout the state.

When the state legislature convenes early next year, it will consider the repeal of all local gasoline taxes. In return, the municipalities would share in the tax collections of the state government.

Since state gasoline taxes are already held insufficient to meet new roadbuilding demands, observers believe that the new law would lead to an increase in the state tax.

What's New / IN MARKETING

J. L. Lenker

B. B. Pettitt

W. A. Bourne

G. E. Millican

J. B. Kelley

Gulf Moves Marketing Headquarters to Houston

Gulf Oil Corp. is putting new emphasis on customer service and sales efficiency in moving its U.S. marketing headquarters to Houston around Sept. 1 (PW—Mar.11'60, p15).

The department has been reorganized, and marketing will now be coordinated out of newly designated regional offices in Philadelphia, Atlanta, Toledo, and Houston—each to be headed by a recently elected vice-president. Divisions—16 of them—will be realigned under the regional vice-presidents, with new distribution boundaries that are more realistic in conjunction with sales, Gulf says.

J. L. Lenker, vice-president in charge of U.S. marketing, will lead the new marketing team, directly assisted by these regional vice-presidents: J. B. Kelley, eastern region; G. E. Millican, southern region; W. A. Bourne, midwestern region; and B. B. Pettitt, southwestern region.

•

Vermont's Attorney General, Thomas M. Debevoise, charges that at least ten dealers in the southern part of the state have been selling the same gasoline from separate pumps at different prices.

All the gasoline has been of regular grade, according to the Attorney General, but the price spread between different pumps in the same station has been as much as 4¢ a gal.

Debevoise says that all of the stations investigated so far are supplied by Northern Oil Co., of Burlington.

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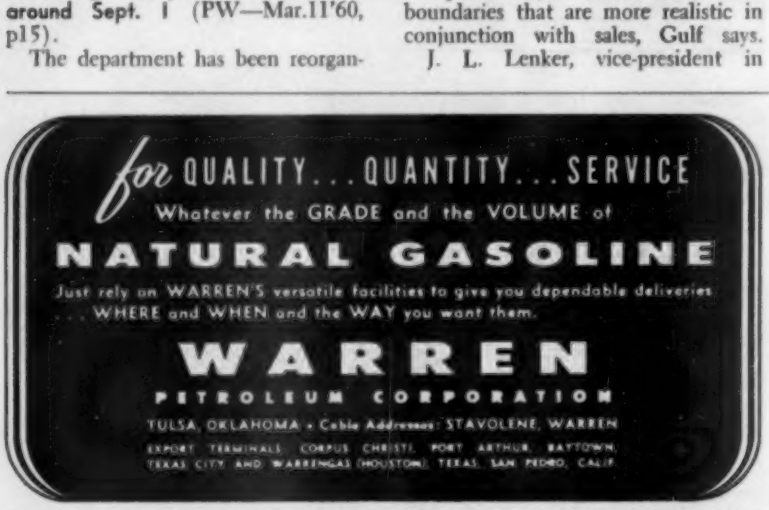
Automation as an aid in oil company marketing operations got a boost at last week's first parley of the Pacific Oil Conference Management Institute, at Seattle.

Dale Finley, a regional traffic manager for Mobil Oil Co., said marketers should use automation equipment whenever possible to replace slower costlier human labor.

He reported that Mobil is saving $30,000 a year in Seattle through automatic computation of route plans for its trucks to use in supplying service stations.

He said that Mobil is now preparing for the next step in automation—the dispatching by one man, using remote control equipment, of trucks in seven Pacific Coast cities.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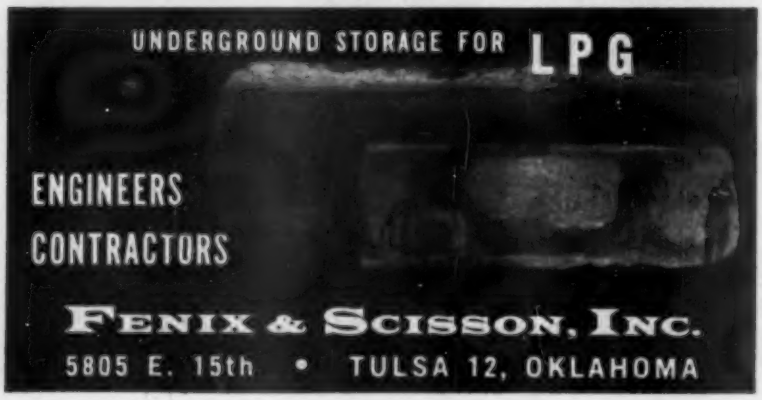

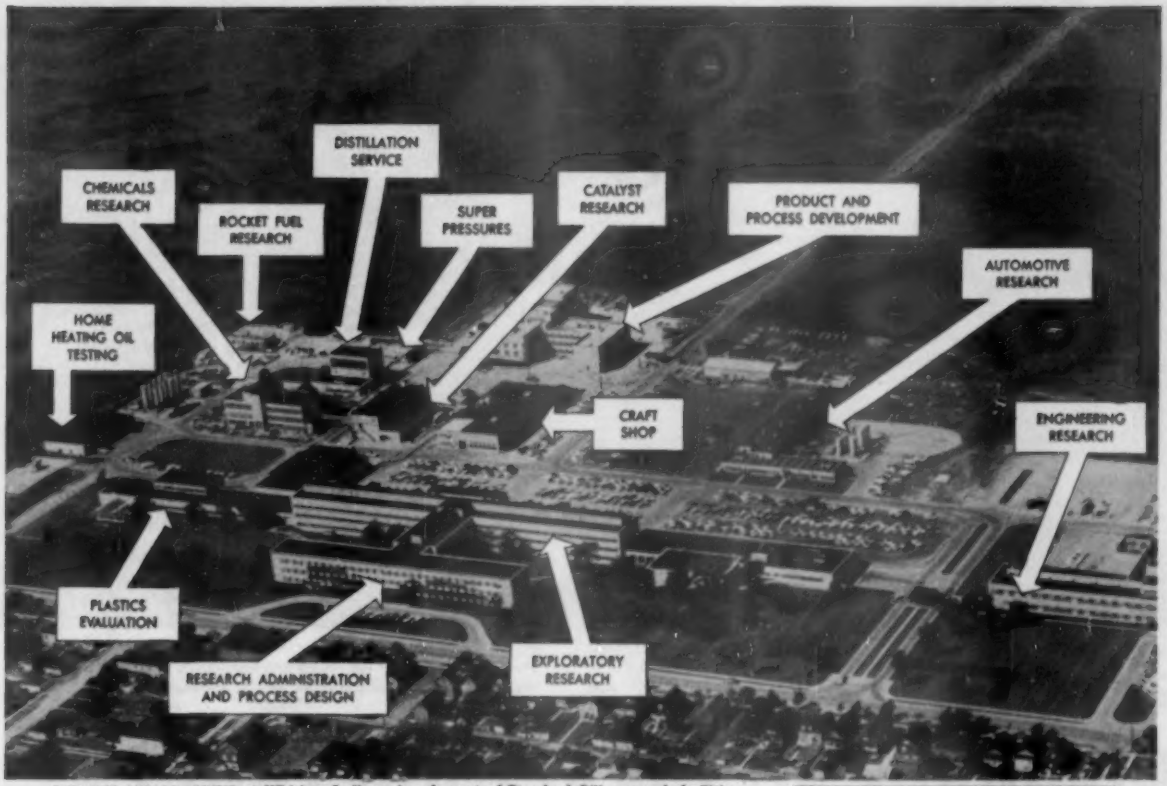

THIS HUGE RESEARCH CENTER at Whiting, Indiana, is only part of Standard Oil's research facilities. Since Standard's first research laboratory opened 70 years ago, Standard scientists have made many contributions to petroleum progress—contributions that have made driving more economical.

Where the fuels of the future are born!

From time to time, we are asked if gasoline and oil today really are better than they were five or ten years ago. People can't see the difference, smell it, or feel it.

The answer is an emphatic yes. And this aerial view of Standard Oil's research center at Whiting, Indiana, is graphic evidence of the extensive research work that goes on behind the scenes before Standard Oil gasoline or oil goes into a car.

Intensive and continuous research has produced spectacular improvements that mean great savings to consumers. For example, in 1930 one gallon of gasoline moved one ton of automobile 25 miles at 40 mph. Today one gallon—after the scientists have finished with it—moves one ton *43 miles* at the same speed!

Today's new cars would have difficulty operating on the type of gasoline that was sold just five years ago! And right now motor fuels are being developed for cars that will not be a reality until about 1965.

Rocket fuels, too, are being developed. In fact, Standard's development of clean-burning, highly-reliable solid fuels has been a real contribution to America's missile program.

Yes, it's true that the difference in gasoline can't be seen, smelled or felt. But thousands of scientists and technicians are working in these laboratories every day to make Standard gasolines and oil better than ever, working to conserve the country's oil for future generations...to make oil *more useful to more people than ever before!*

What makes a company a good citizen?

Looking ahead, preparing for the future is one measure of good citizenship. If a company is heedless of the future, it endangers the economic well-being of its employees, its stockholders and the communities in which it lives and works. That is why research has played a major role at Standard for 70 years.

FINDING MORE OIL and finding it faster is the main job of this gigantic research center of Pan American Petroleum Corporation, a Standard affiliate. It is in Tulsa, Oklahoma, and is famous for inventions that have added billions of barrels to America's oil reserves.

STANDARD OIL COMPANY
(INDIANA)

STANDARD

THE SIGN OF PROGRESS...
THROUGH RESEARCH

This lineup of Wilson-Snyder Process Pumps handles the various streams in Alkylation Process requirements. First pump in the line is a two-stage unit handling hydrofluoric acid for the overhead regenerator at 700 ft. differential head.

Planning an Alkylation Unit?

This two-stage pump in stripper bottoms service handles light hydrocarbons at 910 ft. differential head.

See why Wilson-Snyder Process Pumps are your BEST buy!

The Material and Specification Requirements . . . associated with pumps for this exacting service can be furnished in Wilson-Snyder Pumps at minimum cost to you, and in the shortest possible time—the result of a broad and well-planned inventory program—which also helps you when replacement parts are needed.

Small Parts Inventory Required—Both single- and two-stage models are designed for maximum interchangeability of parts. Only 4 sizes of bearing bracket assemblies service 22 different sizes of pumps so that investment in replacement parts is extremely small.

Maintenance Is Simplified—These pumps can be readily dismantled for inspection and maintenance without disturbing piping connections or driver unit. The entire rotating assembly can be removed for servicing, after removing the coupling spacer and the nuts from the case-parting flange.

Convenient Application Service . . . on Wilson-Snyder Process Pumps can be secured through your nearest "Oilwell" Branch . . . or Wilson-Snyder Sales Engineers at Chicago, Illinois; Dallas, Texas; Houston, Texas; Los Angeles, California; New York, N. Y.; Tulsa, Oklahoma; or Pittsburgh, Pa.

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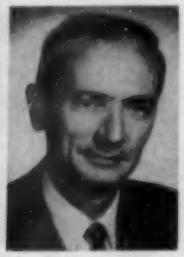


G. M. Cunningham O. F. Van Beveren

O. F. VAN BEVEREN has been elected president of American Overseas Petroleum, Ltd., a member of the Caltex group of companies. Van Beveren, formerly a vice-president of Amoseas, succeeds **GEORGE M. CUNNINGHAM**, who is retiring.

IRVIN C. STAEUBLE and **NORMAN T. ROBEY** have been appointed managers of Indiana Standard's Sugar Creek (Mo.) and Neodesha (Kan.) refineries, respectively. Staeuble, formerly assistant manager at Sugar Creek, succeeds **P. Craig Livesay** there. Robey, formerly assistant manager at Neodesha, succeeds **John H. Johnsen**. Both Livesay and Johnsen are being transferred to the manufacturing department general office in Chicago for special assignments. **Jens A. Norgaard**, mechanical division superintendent at the Whiting (Ind.) refinery, will replace Staeuble, and **James N. Roper**, planning and scheduling superintendent at Whiting, will succeed Robey. **C. A. Cogan**, assistant manager in the operations division at the Chicago general office, replaces Roper at Whiting.

JAMES K. WOOTAN and **E. PAUL LUDMAN** have been named vice-presidents of Signal Oil & Gas Co. Wootan, who will be in charge of exploration, was formerly director of exploration. Ludman was formerly treasurer of the company. At the same time, **Samuel B. Mosher**, chairman said: "In our continuing efforts to consolidate the policies and personnel of the four companies merged in less than two years, the board has been reduced from 26 to 14 members."

JOHN H. WATKINS becomes district office supervisor of Tennessee Gas & Oil Co., Wichita Falls, Tex., a division of Tennessee Gas Transmission Co. Watkins, who joined the company in 1957, was formerly senior production clerk in the company's Oklahoma City office. He succeeds **E. L. Patterson**, who is now with the company office in Lafayette, La.

W. A. (Bob) ROBERTS has been appointed superintendent of the central division of Phillips Petroleum Co.'s production department, in Oklahoma City. Roberts was formerly superintendent of the department's California production district. He succeeds **W. M. Schul**, who has retired. **E. E. Clark** assumes Roberts' former position as superintendent of the California district, and **L. H. Hoelscher**, district engineer in California, becomes assistant superintendent of the California district. **M. L. McKee** becomes assistant superintendent of the North Burbank (Calif.) unit, replacing Clark.

R. B. BENNETT has been promoted to section head in the research and development division of Humble Oil & Refining Co., Baytown, Texas. He will also serve as petroleum specialties advisor to the manager of the manufacturing department of the Humble division. **S. P. Blumberg** is a research specialist in the division. He formerly served as head of the control and specification laboratory at the new polyolefin plant at Humble's Baytown refinery.

R. B. Bennett J. W. McDonald

J. W. McDONALD has been appointed exploration manager of Shell Oil Co.'s eastern division, in Pittsburgh. McDonald, who joined the company in 1941, was formerly area geologist in Shell's Pacific Coast area office, Los Angeles. He succeeds **P. W. Fairchild**, who is now on special assignment in the company's head office in New York.

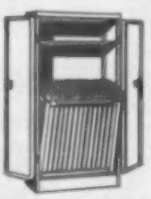
GORDON M. MACE, JR., vice-president, has been elected to the board of Independent Exploration Co., Houston. Mace resigned as president of Marine Exploration Co., Houston, to join Independent when the latter bought out the geophysical operations of Marine Exploration in December, 1959.

JOHN BABB is the newly elected president of the Jackson (Miss.) Geophysical Society. He is with Delta Exploration Company. **Tom Tillman**, Sun Oil Co., is vice-president, and **Jim Watson**, Humble's Carter Division, is secretary-treasurer.

J. E. TRIGG has been elected a director of Tekoil Corp. He is a partner in Trigg Drilling Co., Oklahoma City. Trigg, a native of Texas, is a veteran in the drilling business; his career dates back to 1919.

J. E. Trigg N. V. Kinsey, Jr.

NORMAN V. KINSEY, JR. has been elected a director of Transcontinental Gas Pipe Line Corp. He succeeds his father, the late **N. V. Kinsey, Sr.**, who was also a director of the company. Kinsey, Jr., was associated from 1947 to 1960 with his father as Kinsey & Kinsey, where he was a manager of the company. He has also been identified with the contruction of other pipelines, including Texas Illinois Natural Gas Pipe Line and Pacific Northwest Pipe Lines.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For Sale small Texas Hill Country ranch, improvements designed for executive entertaining. Situated on Gillespie and Llano Counties line between Llano and Fredericksburg. Loaded with whitetail deer, some turkey, doves and quail, 504 acres, 1900 feet elevation, on all weather road. Several large lakes are within an hours drive. Attractive hacienda provides magnificent view of several mountains and a beautiful countryside that is sparsely populated. Climate is invigorating, summer nights require blankets. Swimming pool, foreman's house, guest house, garages, horse barn, corral and other buildings all in excellent repair. Well fenced, ample water supply, two earthen water tanks, and all facilities for ranching or entertaining. Entire pasture can be hunted from an automobile. Immediate possession, furnished; $30,000 cash, owner will carry balance. Shown by appointment only. C. R. Allen, P.O. Box 1402, Corpus Christie, Texas. TU 4-2319 or TU 3-3081.

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Hazel Van Middlesworth

PHILIP D. McMANUS has been named general manager of the Smith-Erie division of A. O. Smith Corp. At the same time, the division has been integrated into the firm's capital equipment group as part of a move to consolidate products directly related to the oil industry. McManus, formerly controller for the company, succeeds **Harry G. Smith,** who is retiring. **H. F. Detrick,** vice-president, continues as head of the capital equipment group.

H. Strauss

P. D. McManus

HELLMUTH (Dick) STRAUSS has been appointed vice-president and general sales manager of Walworth Co., manufacturer of valves and fittings. He is returning to the company he served as an executive and board member for more than 25 years before leaving in 1957. He succeeds **Harold Brown,** who has resigned.

GERALD REED has joined Tex-Tube, Inc., as general foreman of production operations. He comes to Tex-Tube from Alberta Phoenix Tube & Pipe, Ltd., Edmonton, where he served as production foreman and as foreman of welding, finishing lines, and material handling departments.

G. Reed

J. Kern

JESS KERN is the new marketing manager of Parkersburg Rig & Reel Co.'s Coffeyville (Kan.) plant. He will be responsible for engineering, manufacturing, production, and all sales services, including pricing and advertising. Kern was formerly plant manager at Coffeyville. **Gene Kaefer** is the new manager of the plant's engineering and sales service department. He was formerly manager of the company's Hydromatic Brake-Hydrotarder product group. In his new position, he will be in charge of the engineering order and inquiry service, and will supervise the Parkersburg pumping unit and Hydromatic Brake-Hydrotarder product groups. **Richard Bardon** is the newly appointed purchasing agent at the Coffeyville plant, and **Tom Sands** is plant controller. **Melvin Jones** will head all production activities.

GEORGE H. MOORE assumes the newly created position of assistant vice-president, marketing, for Magnet Cove Barium Corp., Houston, one of the Dresser Industries. He was formerly manager of the industrial sales department. In his new position, he will assist **I. W. Hoskins,** senior vice-president, marketing, in sales within the domestic drilling mud department, the foreign sales department, and the industrial sales department. **Ray E. Dillman** has been appointed an assistant sales manager in the northern area, a newly created position, responsible to the drilling mud department sales manager. He remains in charge of Magcobar's Tulsa office, where he was formerly regional sales coordinator. In his new position, Dillman will also coordinate the sales activities of the northeastern, Mid-Continent, and Rocky Mountain regions. **L. B. Gale, Jr.,** formerly dealer representative in Houston, has been named to the newly created position of distribution manager there. This is also a staff function responsible to the drilling mud department sales manager. **Myron Robertson** has been promoted to assistant regional sales manager of the northern division. He will remain in Liberal, Kan., where he was formerly northern division sales representative for the Mid-Continent region. In his new position, he succeeds **Delbert C. Brooks,** who has been transferred from Oklahoma City to Tulsa, and appointed assistant to the regional sales manager.

G. H. Moore

A. P. Moran

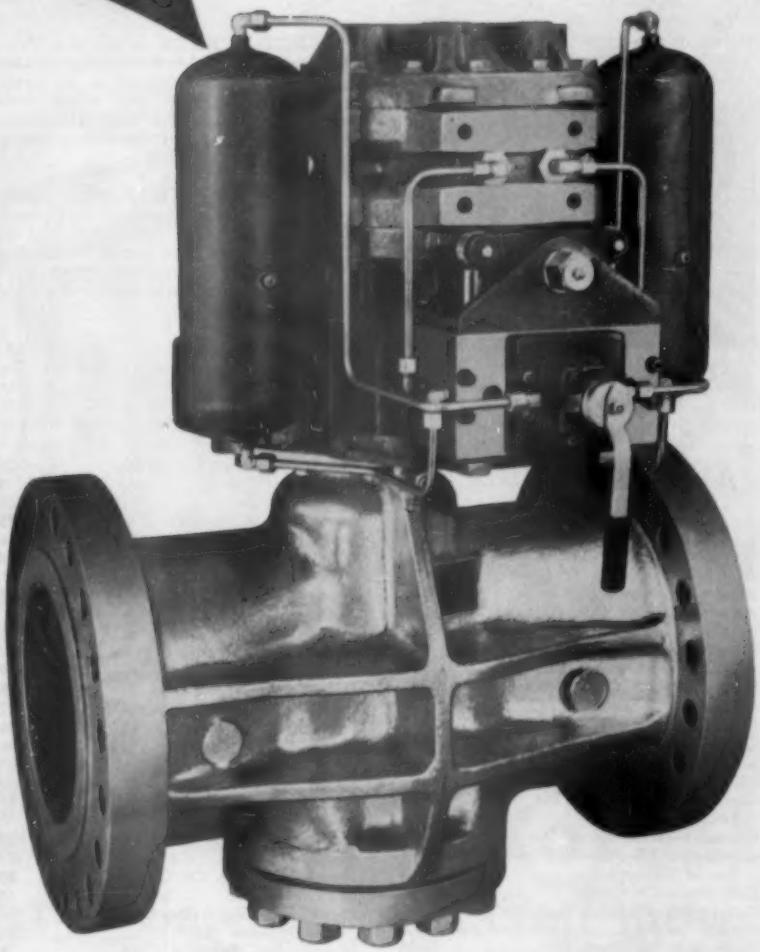
ARNOLD P. MORAN has been elected vice-president-treasurer of U.S. Industries, Inc., New York. Moran, who joined USI in 1950 as budget director, has also served as assistant to the vice-president and treasurer, assistant treasurer, and controller.

ROBERT H. RANDALL has been named a vice-president of Aero Service Corp. He was formerly assistant on cartography with the U.S. Bureau of Budget.

JOHN P. KLEBER has been appointed manager of the newly organized water chemical sales division of Hagan Chemicals & Controls, Inc., Pittsburgh, Pa. He was formerly manager of the firm's municipal and process waters department. In his new position, Kleber will coordinate

LimiTorque INTRODUCES.... the new type "G" series GAS-HYDRAULIC OPERATORS for plug valves of any size

SIMPLE • RELIABLE • ECONOMICAL • FAST • SMOOTH OPERATION • DELIVERS TORQUE "WITHOUT SHOCK," THROUGH ONLY ONE MOVING PART



These operators have oscillating vane type Hydraulic motors, applying power directly to the plug valve stem—they can be mounted in any position, and are designed to eliminate the usual gearing found on plug valves.

The new LimiTorque type "G" operators are designed primarily for utilization of gas pressure from the pipe line on which they are installed; however, they can be operated by air or liquids from other pressure sources —with or without accumulators.

For pressure operation, the units are equipped with a shear-seal type directional control valve having three positions: Valve open, valve closed, and neutral. For manual operation, the units operate through a specially designed hand pump mounted on the side of the vane motor. The type "G" units can be easily mounted on the plug valve, and because they are directly centered over the shaft . . . It is not necessary to remove the valve from service in order to install the type "G" unit. No maintenance is required with these operators, and it is not necessary to check the level of oil in the accumulation tanks, as this is taken care of automatically.

For complete information, contact your valve manufacturer, or your nearest LimiTorque Sales Engineering Office.

Write for Bulletin 7A-60

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INDUSTRIAL GEARS & SPEED REDUCERS
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sales of boiler water, municipal, and cooling water chemicals.

HARRY L. CUTLER has been promoted to system sales manager in the petroleum and petrochemical fields for Daystrom, Inc., control systems division. Other system sales managers named are **James S. Burr**, responsible for sales in the chemical and nuclear industries, and **Thomas Waldrop**, in the utility industry. All three, as well as **Thomas R. Hudson**, who was promoted to technical consultant, will work out of the division's headquarters in La Jolla, Calif. In addition, four area representatives have been named systems engineering coordinators: **Robert R. Burns**, Washington (D.C.) area; **W. Martin Lyford**, northeastern U.S.; **Robert Richards**, southern and southwestern; and **Alden H. Webber**, west and Rocky Mountain area.

H. L. Cutler

A. L. Boynton

AL L. BOYNTON is the new manager of geophysical and industrial recording supplies for Southwestern Industrial Electronics, one of the Dresser Industries. He will continue contract negotiations for SIE's fabrication and machine shop facilities.

MEL WOODS is Hunt Tool Co.'s new plant manager at Jennings, La. He was formerly sales engineer at the Hunt shipyard at Harvey, La. Before joining the company, he was a sales representative for Gardner-Denver Co.

LLOYD A. ALABACK is a new sales representative in Tulsa for the industrial and oil field division of Young Radiator Co., Racine, Wis. Alaback heads Thermal Engineering Co., in Tulsa.

ROBERT A. RATH is the new vice-president of sales for Spang & Co., Butler, Pa., manufacturer of cable tools for oil, gas, and water well drilling. He has also been sales manager for Butler Refractories, a Spang affiliate.

RALPH KEMP, JR., is sales representative for the oilfield equipment division of Delta Tank Mfg. Co. in Midland, Tex., and **James A. Kepley** is district engineer there. Both men have previous oilfield equipment sales experience.

W. H. ATTLESEY has been appointed export sales representative for Houston Oil Field Material Co. He has been associated with Superior Oil Co. and Eastman Oilwell Survey Co., and has held petroleum engineering posts with E. B. Hall & Co., Victory Oil Co., and Harvey-Williams Drilling Co.

BOVAIRD SUPPLY CO. has become a stocking distributor of Gardner-Denver Co.'s mud pumps and other petroleum equipment. Gardner-Denver's equipment will be available at all Bovaird stores in Oklahoma, Kansas, Texas, New Mexico, Louisiana, and Illinois.

GENE P. ROBERS has been appointed general sales manager, Thermoid division, H. K. Porter Co., with headquarters in Pittsburgh. He was formerly a vice-president of the Carter carburetor division of ACF Industries.

G. P. Robers

C. F. Piper

C. F. (Chuck) PIPER has been named sales manager of Drilling Equipment Manufacturing Co., Oklahoma City. He was formerly special sales representative.

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Jackson 3-6951

Boston 16 — David G. Sawyer
350 Park Square Bldg.
Hubbard 7-7160

Chicago 11 — Edward A. Callahan Jr.
520 N. Michigan Avenue
Mohawk 4-5800

Cleveland 15 — Marcus A. Loy, Jr.
1164 Illuminating Bldg.
55 Public Square
Superior 1-7000

Dallas 1 — James R. Pierce
901 Vaughan Bldg.
1712 Commerce Street
Riverside 7-9721

Denver 2 — J. W. Patten
Tower Bldg., 1700 Broadway
Alpine 5-2981

Houston 25 — D. O. Hanson
724 Prudential Bldg.
Jackson 6-1281

Los Angeles 17 — Peter C. Carberry
1125 W. Sixth St.
Huntley 2-5450

New York 36 — David G. Sawyer
500 Fifth Ave.
Oxford 5-5959

Pittsburgh 22 — Marcus A. Loy, Jr.
6 Penn Center Plaza
Locust 8-4330

Pittsburgh 22 — J. E. MacArthur
Room 1111, Oliver Bldg.
Express 1-1314

San Francisco 4 — William C. Woolston
68 Post Street
Douglas 2-4600

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909 Enterprise Bldg.
522 South Boston
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England, London E. C. 4 — E. E. Schirmer
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What price luxury? Gasoline is taxed more than mink.

Indispensable gasoline is taxed an average 33%, Milady's mink—10%.

When consumers complain, however, about "the high price of gas," they don't seem to know they now pay less (before taxes) for 100 octane gasoline than they did for 50 octane thirty-five years ago. They don't know that two gallons now do the work of three, saving them millions of dollars each year. They don't know, but you do. Next time you get a chance, tell them about it.

SHELL OIL COMPANY

Government Controls Are Bad, But . . .

THE INDUSTRY HAS OPERATED in the past with less inventory of crude than the 241-million bbl. it has now. Stocks dropped to 233.8-million bbl. at the end of March, 1951, and they were even lower during World War II.

But when the previous low point was reached in early 1951, both demand and refinery runs were at much lower levels—in fact 2-million b/d lower in each case—than they are now. And in that year, both crude and product stocks were built up during the summer and fall months, so that by year's end crude stocks had expanded 9.4% over the March low to 255.8-million bbl. and product inventories had risen 11% to 359-million bbl.

TIMES WERE A LITTLE DIFFERENT THEN. That was before the incremental barrel became so popular; refiners in those days were not so inclined to grind up every available barrel of crude into products.

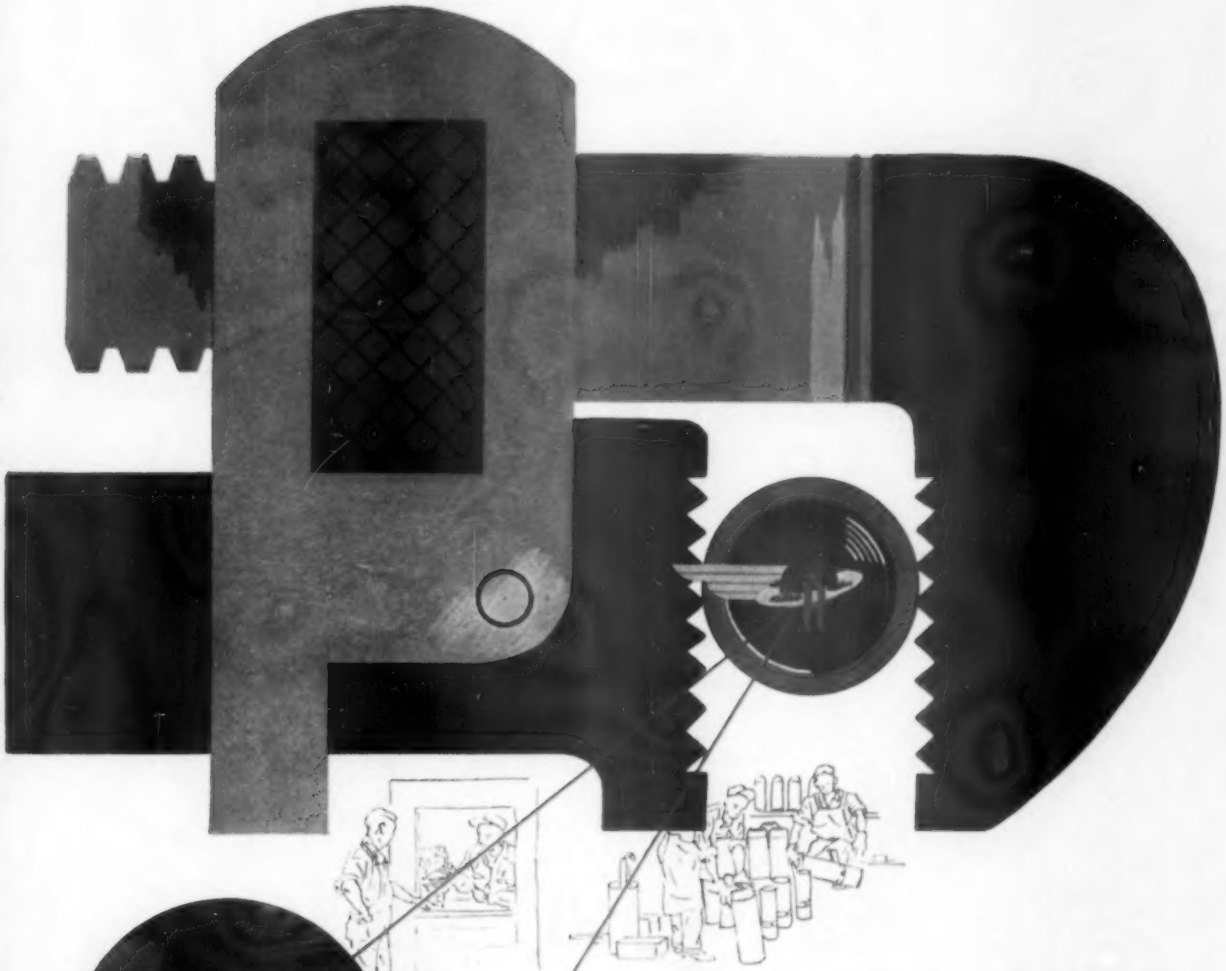
If the refiners' estimates of so-called desirable stock levels are correct, then an interpolation of their own figures indicates that the proper level of crude stocks at this time of the year would be in the range of 251-million bbl., gradually increasing to 253-million bbl. by Nov. 1.

With product stocks already in surplus—and particularly with gasoline inventories just having taken a contraseasonal move upward—state conservation agencies would be risking a lot by permitting higher production levels to build crude stocks to their proper levels. Extra crude made available would just add to the seriously excessive inventories of light products.

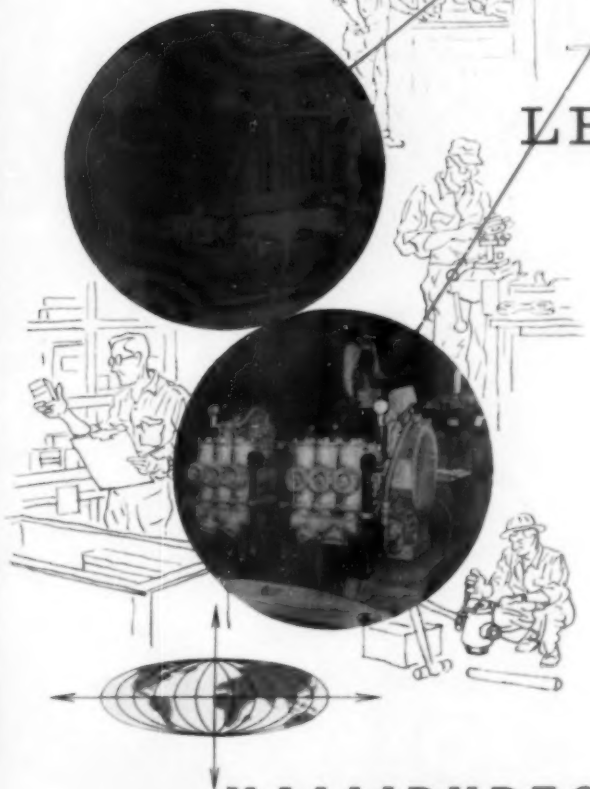
IT IS A TRULY SAD SITUATION when any adult industry has to depend on governmental bodies to regulate its diet. Oil industry spokesmen frequently point to the dangers of growing federal and state regulation. But at the same time, at open hearings, they have said that the only way to control refinery runs is to reduce state allowables.

Ernest O. Thompson, chairman of the Texas Railroad Commission, summed the situation up pretty well recently: "There just never seems to be any protracted period when supply is maintained in line with demand requirements. By contrast, the steel industry has no compunctions about holding its operating rate at 50% of capacity, or below, if the situation so warrants."

It's worth noting that government agencies aren't needed to regulate the supplies of iron ore.



LET'S TALK SHOP



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They are the machinists, foremen, inspectors, helpers, assemblymen in the Halliburton plants and field mechanics on duty in each of Halliburton's 275 Service Centers and Stocking Points dotting the oilfields of the world.

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Dependable equipment can only result from dependable people. We're glad to have them!

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MORE EFFECTIVE ACIDIZING WITH THE EXCLUSIVE NEW "ACID GUIDE" BEGINS HERE

This is a Dowell field laboratory. From more than 40 such installations strategically located throughout the oil producing areas, Dowell can provide a new method for engineering more effective acid treatments. This new method is called the "Acid Guide."* When the "Acid Guide" is used as a basis for planning a treatment, the Dowell engineer first tests core samples or cuttings for solubility and reaction rate. Using this data, he can determine the optimum injection rate, amount of acid and acid formula. This new, greatly improved method for planning and predicting the results of oil well acidizing treatments is available *only* from Dowell . . . and at no extra cost . . . another example that you get more for your money when you *dial Dowell.* Dowell, Tulsa 1, Oklahoma.

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